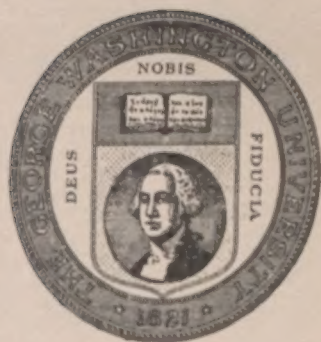


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PART I.

THE UNIVERSITY.

The George Washington University.

UNIVERSITY CALENDAR.

1907.

- January 1, *Tuesday*.—Last day on which Theses may be presented for Graduation at the Winter Convocation.
- January 31, *Thursday*.—Mid-Year Examinations completed in the Department of Arts and Sciences.
- February 1, *Friday*.—Second Term begins.
- February 1, *Friday*.—Annual Meeting of the Alumni Association.
- February 4, *Monday*.—Doctorate Disputation.
- February 22, *Friday*.—Winter Convocation.
- March 29-April 1, *Friday to Monday*, both inclusive.—Easter holidays.
- April 3, *Wednesday*.—Davis Prize Speaking.
- May 1, *Wednesday*.—Last day on which Theses may be presented.
- May 15, *Wednesday*.—Examinations for Degrees completed.
- May 27, *Monday*.—Doctorate Disputation.
- May 28, 29, 31, June 1, *Tuesday, Wednesday, Friday, and Saturday*—Examinations for admission.
- June 2, *Sunday*.—Baccalaureate Sermon.
- June 5, *Wednesday*.—University Commencement

SUMMER VACATION.

- September 18, *Wednesday*.—Fall examinations in the Department of Medicine.
- September 16-20, *Monday to Friday*—Examinations for admission.
- September 25, *Wednesday*.—Academic Year begins in all Departments of the University.
- October 16, *Wednesday*.—Fall Convocation.
- November 28-30, *Thursday to Saturday*, both inclusive.—Thanksgiving recess.
- RECESS FROM DECEMBER 23, 1907, TO JANUARY 2, 1908, BOTH INCLUSIVE 1908.
- January 31, *Friday*.—Mid-Year Examinations completed in the Department of Arts and Sciences.
- February 1, *Saturday*.—Second Term begins.
- February 3, *Monday*.—Doctorate Disputation.

1908.

February 22, *Saturday*.—Winter Convocation.

February 22, *Saturday*.—Annual Meeting of the Alumni Association.

April 17-20, *Friday to Monday*, both inclusive.—Easter holidays.

April 22, *Wednesday*.—Davis Prize Speaking.

May 1, *Friday*.—Last day on which Theses may be presented.

May 13, *Wednesday*.—Examinations for Degrees completed.

May 25, *Monday*.—Doctorate Disputation.

May 26, 27, 28, 29, *Tuesday to Friday*.—Examinations for admission.

May 31, *Sunday*.—Baccalaureate Sermon.

June 3, *Wednesday*.—University Commencement.

CHRONOLOGICAL TABLE.

1790. George Washington's last will and testament, urging the establishment of a University in Washington.
1821. Charter granted by Act of Congress creating "The Columbian College in the District of Columbia."
1825. The Medical School organized.
1805. The Law School organized.
1806. Mr. W. W. Corcoran gave the Medical School a building, 1325 H street.
1872. Mr. Corcoran gave an endowment "to make the College an University."
1873. Act of Congress changing the name to the Columbian University.
1884. University building, Fifteenth and H streets, occupied by various departments of the University.
1884. The Corcoran Scientific School organized.
1887. The Dental School organized.
1893. The School of Graduate Studies organized.
1898. The Department of Jurisprudence and Diplomacy organized.
1898. Incorporation of the George Washington Memorial Association.
1902. Merging of the College, the Corcoran Scientific School, and the School of Graduate Studies into one Department of Arts and Sciences.
1903. Conferences between representatives of the Washington Memorial Institution, the George Washington Memorial Association, and the Columbian University with a view to cooperation in graduate work.
1904. January 23. Act of Congress making the University non-sectarian and giving the Board of Trustees power to change the name.
1904. Suggestion of the George Washington Memorial Association that Columbian University change its name to The George Washington University, and its offer to erect a memorial building on the new site, at a cost of \$500,000, for graduate study and scientific research, accepted by the Board of Trustees.
1904. September 1. Change of name to The George Washington University.
1905. February 22. First Winter Convocation of The George Washington University.
1905. Act of Congress authorizing the incorporation of colleges under the University charter.
1905. Organization under the University charter of the Columbian College, the Washington College of Engineering, and the National College of Pharmacy.
1907. Organization of the College of the Political Sciences.
1907. Organization of the Division of Education.

SOME IMPORTANT PROVISIONS IN THE CHARTER.

Degrees.—The Board of Trustees may confer "such degrees in the liberal arts and sciences to such pupils of the institution or others whom by their proficiency in learning or their meritorious distinction they shall think entitled to them, as are usually granted and conferred * * * and to grant to such graduates diplomas or certificates under the common seal * * * to authenticate and perpetuate the memory of such graduation."

(Act of Congress, 1821.)

A Board of Trustees, "consisting of twenty-two members. The President of the University shall be *ex-officio* a member of said Board, and the remaining twenty-one shall be divided in three classes with seven members in each class," the term of service being three years.

(Act of Congress, 1808.)

"The George Washington University shall have, and is hereby given, power to increase the number of its Trustees from time to time by two-thirds vote of the whole number of the Trustees at the time such vote is taken, to a number not exceeding forty-five."

(Act of Congress, 1905.)

Property and Endowment.—"Shall be competent and capable at law and in equity to take * * * any estate, in any messuage, lands, tenements, hereditaments, goods, chattels, moneys, and other effects, by gift, grant, bargain, sale, conveyance, assurance, will, devise, or bequest, of any person or persons whatsoever, * * * and the same to grant, bargain, or sell, convey, assure, demise, and to farm let, and place out on interest for the use of said College, in such manner as to them shall seem most beneficial to the institution, and to receive the rents, issues and profits, income and interest of the same and to apply the same to the proper use and benefit of the said College"

(Act of Congress, 1821.)

"That power is hereby given the Board of Trustees * * * to change the name of said University, * * * and thereupon the University shall be known and designated by the name adopted, and by said new name the said University shall be vested with and convey its real estate, hold, control, and administer endowments and gifts of money and property heretofore and hereafter made for the maintenance of its educational work and do and perform all acts which it now has the power to do under its said charter. Such change of name shall not in any other way change, affect, or modify in any degree the rights, privileges, obligations, and powers of the said University under the charter of February ninth, eighteen hundred and twenty-one, and the amendatory acts thereto."

(Act of Congress, 1904.)

Non-sectarian.—"That persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as president, professor, tutor, or pupil, be refused admittance into said University, or denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

(Act of Congress, 1904.)

Power to Organize Colleges.—"That by and with the consent of the said University, colleges may be organized hereunder for the purpose of carrying on, in connection with the University, special lines of educational work in the arts, sciences, and liberal and technical knowledge, **such colleges to be educationally a part of the system of the University,** but upon independent financial foundations, and to this end any five or more persons desirous of associating themselves for the purpose of establishing a college hereunder may make, sign, and acknowledge before any officer authorized to take acknowledgment of deeds in the District of Columbia, and with the assent of the University in writing, file in the office of the Recorder of Deeds of the said District a certificate in writing, in which shall be stated: * * * Upon filing such certificate the Trustees named therein and their successors shall be a body politic, incorporated by the name and style stated in the certificate, and by that name and style shall have perpetual succession in association with the University, with power in the college to sue and be sued; plead and be impleaded; to acquire, hold, and convey property in all legal ways; to receive by gift, devise, or otherwise, and hold, control, and administer endowments and gifts of money and property thereafter made to it for the maintenance of its educational work; * * * but said college shall not confer academic or honorary degrees; such college shall hold the property of the institution and all moneys and property conveyed to it by purchase, gift, conveyance, will, devise, or bequest solely for the purpose of the educational work specified in said certificate."

(Act of Congress, 1905.)

Affiliated Colleges.—"That said University may enter into affiliated agreements with any institutions of learning outside of the District of Columbia, for the purpose of giving to students of such institutions the educational facilities of said University, and the departments of the Government in the city of Washington which are by law open to students, upon such terms as are mutually agreed upon by the said University and the affiliated institutions."

(Act of Congress, 1905.)

Boards of Visitors.—"Said Board may also appoint a board or boards of visitors for any department or departments of educational work carried on by the University, such boards of visitors to be advisory only."

(Act of Congress, 1905.)

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1907.

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JOHN JOY EDSON, LL.B.

1908.

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FRANCIS G. NEWLANDS, LL.D.

HENRY B. F. MACFARLAND.

ALEXANDER GRAHAM BELL, LL.D.

1909.

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Faculty of Dentistry: SHALLENGER, RICHARDSON, GALLINGER.

Department of Law: MATTINGLY, LARNER, MONTAGUE.

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(Arranged, with the exception of the President, in groups, in the order of appointment.)

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- * Absent on leave

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HOMER S. MEDFORD, M.D.	Instructor in Obstetrics
L. H. REICHELDERFER, M.D.	Instructor in Medicine
EDGAR P. COPELAND, M.D.	Instructor in Surgery and in Pediatrics
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LEVI RUSSELL ALDEN, A.M.	Instructor in History
JOHN WILMER LATIMER, LL.B.	Clerk of the Moot Court
F. L. MOLEY	Instructor in Freehand Drawing
O. A. M. MCKIMMIE, M.D.	Clinical Instructor in Laryngology and Ophthalmology
H. S. DYE, M.D.	Clinical Instructor in Laryngology and Ophthalmology
OTIS D. SWETT, B.S., LL.M.	Instructor in Chemistry
OSCAR L. KEITH, A.M.	Instructor in Romance Languages
HENRY R. ELLIOTT, M.D.	Instructor in Physiology
WALTER H. MERRILL, M.D.	Instructor in Electro-Therapeutics
EDWIN V. DUNSTAN, C.E.	Instructor in Civil Engineering
ADOLPH A. HOEHLING, JR.	Associate Justice of the Moot Court of Appeals

B. M. RANDOLPH, M.D.	Instructor in Pharmacology
CHARLES MASON REMEY.	Instructor in Architecture
W. A. FRANKLAND, M.D.	Instructor of Anatomy and Clinical Gynecology
CHARLES M. BEALI.	Instructor in Physical Diagnosis
HARRY C. COBURN, M.D.	Instructor in Physical Diagnosis and Demonstrator of Bacteriology and Pathology
J. LAWN THOMPSON, M.D.	Instructor in Surgery
THOMAS F. J. MAGUIRE, S.B.	Instructor in Electrical Engineering
GEORGE ALBERT ROSS, M.S.	Instructor in Mathematics
ELMER S. NEWTON, B.A., M.D.	Instructor in Chemistry
OSCAR A. MECHLIN, C.E.	Instructor in Civil Engineering
JAMES F. PEAKE, A.M.	Instructor in History
WALTER O. SNELLING, B.S., M.S.	Instructor in Chemistry
ARTHUR CUTTS WILLARD, B.S.	Instructor in Mechanical Engineering
EVERETT W. VARNEY.	Instructor in Physics and Electricity
CHARLES B. NEWCOMER, Ph.D.	Instructor in Greek and Latin
FREDERICK I. BARTLETT, D.D.S.	Instructor in Crown and Bridge Work and in Prosthetic Technics
HOWARD P. COBEY, D.D.S.	Instructor in Porcelain Work
TRUMAN ABBE, M.D.	Instructor in Physiology
ARTHUR B. COOPER, D.D.S.	Instructor in Porcelain Work
A. B. HOOR, M.D.	Clinical Instructor in Gynecology
ALLEN S. WOLFE, D.D.S.	Instructor in Crown and Bridge Work and Prosthetic Technics
HURON W. LAWSON, M.D., M.S.	Instructor in Bacteriology and Pathology
CADMUS LINDEN ODOR, D.D.S.	Demonstrator of Operative Technics
CHARLES L. BOVÉE, D.D.S.	Demonstrator in the Dental Infirmary
JOSEPH WOOD POLLOCK, D.D.S.	Assistant Demonstrator in the Dental Infirmary
ARTHUR MILLARD TRIVETT, D. D.S.	Assistant Demonstrator in the Dental Infirmary
THOMAS R. WILKERSON, D.D.S.	Assistant Demonstrator in the Dental Infirmary
GEORGE B. HEINECKE, M.D.	Assistant Demonstrator of Anatomy
EDWARD ELLIOTT RICHARDSON, M.D., M.S.	Assistant Demonstrator of Anatomy
JOSEPH D. RODGERS, M.D.	Assistant Demonstrator of Anatomy
EDWIN SMITH, JR., B.S.	Assistant in Assaying
HENRY M. JEWETT, M.D.	Assistant Instructor in Histology
WILLIAM E. HILLYER, M.S.	Assistant in Chemistry
HENRY VERNON JOHNSTON.	Pharmacist in the Hospital
WILBUR R. BRANDENBURG, M.D.	Demonstrator of Bacteriology and Pathology

ERNEST W. BROWN.....	Assistant in Chemistry
E. T. M. FRANKLIN.....	Assistant in Minor Surgery
W. J. FRENCH.....	Assistant in Minor Surgery
A. L. HUNT.....	Assistant in Minor Surgery
CHARLES W. HYDE.....	Assistant in Surgical Dispensary and Medical Dispensary
HUBERT P. ILLMAN.....	Assistant in Architecture
GLENN I. JONES, M.D.....	Assistant Demonstrator of Anatomy
E. P. MAGRUDER, A.M., M.D.....	Assistant Demonstrator of Anatomy
J. J. WHARTON, M.D.....	Assistant Demonstrator of Anatomy
J. D. MURRAY, M.D.....	Assistant Demonstrator of Anatomy
DANIEL T. BIRTWELL, M.D.....	Assistant Demonstrator of Anatomy
JOHN PAUL FREY.....	Assistant in the Chemical Laboratory
A. PATTON CLARK.....	Assistant in Chemistry
W. O. OWEN, M.D.....	Assistant Demonstrator of Anatomy
W. E. CLARK, M.D.....	Assistant in Bacteriology and Pathology
M. E. HARRISON, D.D.S.....	Assistant Demonstrator in the Dental Infirmary
C. F. STEARNE, M.D.....	Assistant in Surgical Dispensary
ADAM KEMBLE, M.D.....	Assistant in the Gynecological Dispensary
C. L. BILLARD, M.D.....	Assistant in the Eye, Ear, Throat, and Nose Dispensary

Lecturers.

OTIS T. MASON, LL.D.....	Lecturer on Anthropology
WILLIAM T. HARRIS, LL.D.....	Lecturer on the Philosophy of History
JOSEPH M. HELLER, M.D.....	Lecturer on Diseases of the Tropics
EDGAR BUCKINGHAM, Ph.D.....	Lecturer on Thermodynamics
FREDERICK E. FOWLE, JR., S.B.....	Lecturer on Astro-Physics
JAMES C. MONAGHAN, A.M.....	Lecturer on the Consular Service
WILLIAM HAMILTON, Ph.D.....	Lecturer on History
NOBLE P. BARNES, M.D.....	Lecturer on Materia Medica
JOHN W. FOSTER.....	Lecturer on Diplomacy and Treaties
A. PRESS, B.S.....	Lecturer in Electrical Engineering
ELMER ELLSWORTH BROWN, Ph.D.....	Lecturer on Education
WILLIAM ESTABROOK CHANCELLOR, Ph.D.....	Lecturer on Education
GEORGE E. MYERS, Ph.D.....	Lecturer on Education
WILLARD S. SMALL, Ph.D.....	Lecturer on Education
WILLIAM W. BLACK, A.M.....	Lecturer on Education
STEPHEN ELLIOTT KRAMER, B.S.....	Lecturer on Education

Library Staff.*Arts and Sciences.*

ALFRED F. W. SCHMIDT, A.M.....	Librarian
MABEL L. SCOTT.....	Assistant

ROLF WALLACE BOND.....Assistant
LULU E. CONNER.....Assistant

Medicine.

W. F. McLAUGHLIN.....Librarian
JOHN M. WILLIS.....Librarian

Law and College of the Political Sciences.

ANDREW CHRISTENSEN.....Assistant Librarian
PAUL A. REHR.....Assistant Librarian

ORGANIZATION.

The George Washington University comprehends the following Departments:

DEPARTMENT OF ARTS AND SCIENCES, including

Faculty of Graduate Studies.
Columbian College.
Washington College of Engineering.
Division of Architecture.
College of the Political Sciences.
Division of Education.

FACULTY OF MEDICINE:

Department of Medicine.
Department of Dentistry.

DEPARTMENT OF LAW.

NATIONAL COLLEGE OF PHARMACY.

THE UNIVERSITY ASSEMBLY.

The University Assembly meets regularly on Wednesdays throughout the session at 12 o'clock. Members of the faculties and students of all departments are expected to be present. The exercises are regularly presided over by the President. Religious services are held, official announcements are made, and an address is given by the President.

THE UNIVERSITY LIBRARY.

The University Library comprehends (1) the Library of the Department of Arts and Sciences, (2) the Law Library, and (3) the Medical Library. It is in charge of the Library Committee, composed of professors in the various departments who administer the expenditure of the annual appropriation for the purchase of new books and look after the general interests of the Library. Details are given under the sections of the Catalogue devoted to the several departments. The Germanic Library of the late Professor Richard Heinzel, of the University of Vienna, recently acquired by the University, contains 7,200 volumes

and pamphlets bearing on Germanic philology and literature, and a large number of works and periodicals in the cognate branches, especially Anglo-Saxon, Old English, the Romance and Slavic languages.

The classical library of the late Professor CURT WACHSMUTH, of the University of Leipsic, has been recently purchased by the University. It contains 7,000 volumes and pamphlets bearing on Greek and Roman philology, literature, archæology, and history.

The Library of Congress is steadily perfecting its collections of standard works in the various branches of university study, and advanced and graduate students are there given every facility for pursuing their investigations.

ANNUAL COMMENCEMENT AND FALL AND WINTER CONVOCATIONS.

The Annual Commencement is held on the first Wednesday in June. The Fall Convocation is held on the third Wednesday in October. The Winter Convocation is held on the 22d of February. Degrees are publicly conferred on Commencement Day and at the Fall and Winter Convocations. Members of the faculties and candidates for degrees are expected to appear in academic caps and gowns. Prizes for special excellence in any department are publicly delivered on Commencement Day.

PRIVILEGES IN GOVERNMENTAL INSTITUTIONS OPEN TO UNIVERSITY STUDENTS.

In order to promote research and the diffusion of knowledge, the Congress of the United States has made the scientific resources of the Government accessible to students under the terms of the following joint resolution, approved April 12, 1892:

"Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the facilities for research and illustration in the following and any other governmental collections now existing or hereafter to be established in the city of Washington for the promotion of knowledge shall be accessible, under such rules and restrictions as the officers in charge of each collection may prescribe, subject to such authority as is now or may hereafter be permitted by law, to the scientific investigators and to students of any institution of higher education now incorporated or hereafter to be incorporated under the laws of Congress or of the District of Columbia, to wit:

1. Of the Library of Congress.
2. Of the National Museum.
3. Of the Patent Office.

4. Of the Bureau of Education.
5. Of the Bureau of Ethnology.
6. Of the Army Medical Museum.
7. Of the Department of Agriculture.
8. Of the Fish Commission.
9. Of the Botanic Gardens.
10. Of the Coast and Geodetic Survey.
11. Of the Geological Survey.
12. Of the Naval Observatory."

Libraries.—In the archives of the State and other Departments and in the statistical bureaus of these Departments are extensive accumulations of original historical documents and data which are invaluable to graduate students in history, political science, economics, sociology, and the allied topics of research. The Library of Congress, the Public Library of the District of Columbia, and the many highly specialized libraries attached to the various Departments of the Government are made easily accessible.

Museums.—In the collections of the National Museum, the Smithsonian Institution, the Army Medical Museum, the Museum of Naval Hygiene, and the departmental museums are found extensive series of specimens of great value to the student of anthropology, archaeology, mineralogy, geology, paleontology, biology in all its branches, and other sciences. In the Patent Office are the records of the many inventions that have contributed so materially during our national existence to modify the conditions under which we live. The Army Medical Museum, which is open for inspection daily, presents a field for study superior to any other institution of the kind, either in this country or in Europe. Its library of medical books and periodicals is the best in the world. It has an unrivaled collection of anatomical and pathological specimens, illustrating normal anatomy and the results of disease in every form, and an almost unlimited number of other preparations showing the effect of gunshot wounds and surgical injuries of every kind. It also contains almost numberless crania of every human nationality. In the National Museum is found the most complete and best arranged collection of *Materia Medica* in the world. The drugs are shown in all their processes of manufacture, from the original package to the delicate alkaloid constituting the active principal.

Laboratories.—In the experimental sciences the most notable facilities are available, since in Washington are centered the Weather Bureau, with its appliances for the study of national problems in meteorology; the Coast and Geodetic Survey, from which the surveys of our territory are carried on and by which the figure of the earth and terrestrial mag-

netism are experimentally determined; the Hydrographic Bureau, which conducts the surveys of foreign coasts and the study of the oceans; the Bureau of Standards, which standardizes the instruments used in measuring mass, volume, heat, light, electricity, and all other magnitudes; the Geological Survey, which investigates the structure of the earth, ascertains our mineral resources, and supervises the sources of supply and means for distribution and control of water for irrigation purposes; the Department of Agriculture, which exists primarily for conducting original investigations for the benefit of agriculture in all its branches, and is therefore provided with extensively equipped laboratories for the study of chemistry, botany, vegetable physiology, entomology, bio-chemistry, bacteriology, comparative pathology, parasitology, the physics and chemistry of the soil, forestry, and microscopy; the Naval Observatory and Nautical Almanac Office, where researches in astronomy and navigation are conducted; the Marine Hospital Service, which deals with national problems in hygiene; the Bureaus of Construction and of Steam Engineering of the Navy, having supervision over the designs and construction of our ships; the Bureau of Yards and Docks, having supervision over the engineering operations at our navy yards and naval stations; the Bureau of Equipment, which is charged with the electrical installations for the Navy; the United States Signal Corps, which has supervision over the electrical installations for the Army; the Engineer Corps of the Army, which is charged with river and harbor improvements, and the Light-House Board, which controls the system for lighting our navigable waters.

Of chemical laboratories for conducting the tests of materials, and especially for research work, there are now eighteen attached to the different departments at Washington. An extensive new laboratory is being equipped for the Marine Hospital and Public Health Service. This is the national health department of the Government. In this laboratory and in the laboratories of the Department of Agriculture there are superior facilities for all kinds of bacteriological and chemical investigations, and for the study of bio-chemistry, comparative pathology, and parasitology. The new laboratories and hospitals of the Army and the Navy also offer many opportunities for instruction.

Washington offers exceptional opportunities for special or advanced work in Mechanical Engineering. The departments of the Government charged with designing are all located here. In the Bureaus of Steam Engineering and of Construction and Repair, and Ordnance, of the Navy, are projected a large amount and extensive variety of heavy constructional work. Here is also located the United States Navy or Ordnance Gun Factory. The Ordnance Proving Station is but a few miles down the Potomac. Tours of inspection may be made to the large steel works and shipbuilding plants in Baltimore, and to the shipbuilding plant at Newport News.

PART II.
DEPARTMENTS OF THE UNIVERSITY.

Department of Arts and Sciences.

The Department of Arts and Sciences comprehends the following:

- I. FACULTY OF GRADUATE STUDIES.
- II. COLUMBIAN COLLEGE.
- III. WASHINGTON COLLEGE OF ENGINEERING.
- IV. DIVISION OF ARCHITECTURE.
- V. COLLEGE OF THE POLITICAL SCIENCES.
- VI. DIVISION OF EDUCATION.

This Department is open to men and women who satisfy its requirements. The session of 1907-1908 begins Wednesday, September 25, 1907. The main building of the University, in which most of the courses of study are conducted, is University Hall, corner Fifteenth and H streets, N. W. The offices of the President, Treasurer, and Registrar of the University are in this building.

I. FACULTY OF GRADUATE STUDIES.

COMMITTEE ON HIGHER DEGREES.

CHARLES E. MUNROE, *Chairman*.
J. MACBRIDE STERRETT.
HERMANN SCHOENFELD.

FACULTY.

CHARLES WILLIS NEEDHAM, LL.D.....PRESIDENT OF THE UNIVERSITY
CHARLES E. MUNROE, Ph.D.....Dean, and Professor of Chemistry
JAMES HOWARD GORE, Ph.D.....Professor of Mathematics
HOWARD LINCOLN HODGKINS, Ph.D.....Professor of Physics
JAMES MACBRIDE STERRETT, D.D.....Professor of Philosophy
HERMANN SCHOENFELD, Ph.D.....Professor of German
CHARLES CLINTON SWISHER, Ph.D., LL.D.....Professor of History
WILLIAM ALLEN WILBUR, A.M.....Professor of English
MITCHELL CARROLL, Ph.D.....Professor of Classical Philology
GEORGE N. HENNING, A.M.....Professor of Romance Languages
THEODORE N. GILL, Ph.D.....Professor of Zoology
CLEVELAND ABBE, LL.D.....Professor of Meteorology
EDGAR FRISBY, A.M.....Professor of Astronomy
FRANK W. CLARKE, Sc.D.....Professor of Mineral Chemistry
HARVEY W. WILEY, Ph.D.....Professor of Agricultural Chemistry
FRANK H. BIGELOW, L.H.D.....Professor of Astro-Physics

GEORGE P. MERRILL, Ph.D.....	Professor of Geology and Mineralogy
FRANK A. WOLFF, Ph.D.....	Professor of Electrical Engineering
HERBERT L. RICE, M.S.....	Professor of Astronomy
HENRY A. PRESSEY, Ph.D.....	Professor of Civil Engineering
PAUL BARTSCH, M.S., Ph.D.....	Professor of Zoölogy
PERCY ASH, C.E.....	Professor of Architecture
C. W. A. VEDITZ, Ph.D.....	Professor of Economics
GEORGE LANSING RAYMOND, L.L.D.....	Professor of Aesthetics
WILLISTON S. HOUGH, Ph.M.....	Professor of Philosophy
HENRY L. ABBOTT, Brig. Gen. U. S. A., LL.D.....	Professor of Hydraulic Engineering
GEORGE M. STERNBERG, Surgeon Gen., U. S. A.....	Professor of Preventive Medicine
EDWARD B. ROSA, Ph.D.....	Professor of Physics
ASAPH HALL, JR., Ph.D.....	Professor of Astronomy
SHEPHERD IVORY FRANZ, Ph.D.....	Professor of Experimental Psychology
ALBERT MANN, A.M., Ph.D.....	Professor of Botany
N. MONROE HOPKINS, Ph.D.....	Assistant Professor of Chemistry
CHARLES SIDNEY SMITH, Ph.D.....	Assistant Professor of Greek and Latin
EDWIN A. HILL, Ph.D.....	Assistant Professor of Stereo-Chemistry
THOMAS M. PRICE, Ph.D.....	Assistant Professor of Biochemistry
PHILANDER BETTS, M.S., E.E.....	Assistant Professor of Electrical Engineering
TIMOTHY W. STANTON, Ph.D.....	Assistant Professor of Paleontology
WILLIAM T. HARRIS, LL.D.....	Lecturer on Philosophy
EDGAR BUCKINGHAM, Ph.D.....	Lecturer on Thermodynamics
FREDERICK E. FOWLE, JR., S.B.....	Lecturer on Astrophysics
A. PRESS, B.S.....	Lecturer on Electrical Engineering
OTIS D. SWETT, B.S.....	Secretary

The Division of Graduate Studies is charged with the development and supervision of research courses leading to the higher degrees. This work was organized at this University in 1893 with a view to enable properly equipped students to avail themselves of the advantages which Washington offers for original investigations. Announcements relative to the official matters of this Division are made at the University Assembly, and professors and students of this Division are expected to be governed by them.

HIGHER DEGREES.

The higher degrees conferred in course by the University in this Division of the Department of Arts and Sciences are Master of Arts (A.M.), Master of Science (M.S.), Civil Engineer (C.E.), Electrical Engineer (E.E.), Mechanical Engineer (M.E.), and Doctor of Philosophy (Ph.D.).

ADMISSION.

Candidates for admission to courses for higher degrees must present the diplomas they hold, or certificates that they have received such diplomas, to the Registrar of the University, and obtain from him application blanks. When properly filled and signed, these applications are to be submitted to the Chairman of the Committee on Higher Degrees, together with catalogues of the institutions from which they hold their degrees and certificates of their course of study at such institutions. All such applications should be accompanied by testimonials as to character and scholarship.

DEGREES OF MASTER OF ARTS AND MASTER OF SCIENCE.

To be admitted to candidacy for the Master's degree a student must have completed a liberal undergraduate course of study such as is required by colleges of good standing antecedent to the baccalaureate degree. The Faculty of Graduate Studies reserves the right to decide in all cases whether the antecedent training fulfils the requirements. Moreover, the courses of study pursued must have been such as to qualify the candidate for pursuing the chosen line of study for the Master's degree.

A candidate for this degree shall pass at least one full year of residence and study at this University, and sustain satisfactory examinations on the studies pursued and present an acceptable thesis, together with a bibliography. Three full courses throughout the year is the minimum required as constituting a full year's work. The courses chosen must be passed upon by the Faculty and have the approval of the professors under whom they are to be taken. These courses may consist of special study or research work. In any case they must form a consistent plan of work, for which the candidate's previous work has qualified him. No work done for a Bachelor's degree shall be counted again for a Master's degree.

HIGHER DEGREES IN ENGINEERING.

To be admitted to candidacy for higher degrees in Engineering a student must have completed a liberal undergraduate course of study such as is required by colleges of good standing antecedent to the baccalaureate degree in Engineering, and of such a character as to fit him to pursue to advantage the study of advanced engineering topics. The Faculty of Graduate Studies reserves the right to decide in all cases whether the antecedent training fulfils the requirements. Moreover, the courses of study pursued for the Bachelor's degree must be approved by the Faculty as qualifying the candidate for pursuing the chosen line of study for the degree.

A candidate for a degree in Engineering shall pass at least one full year of residence and study at this University, and sustain satisfactory examinations on the studies pursued and present an acceptable thesis, together with a bibliography. Three full courses is the minimum required as constituting a full year's work. At least one-half of this work must be in the course in which the degree is sought and the balance in correlated courses. The courses chosen must be passed upon by the Faculty of Graduate Studies and have the approval of the professors under whom they are to be taken.

DEGREE OF DOCTOR OF PHILOSOPHY.

The degree of Doctor of Philosophy is conferred upon students who have pursued specialized courses in university subjects and engaged in original research in certain of the various departments of letters or science, under university auspices, for a period of not less than three years, and have submitted an acceptable thesis and met all the requirements prescribed. The degree is given, not because of the faithful completion of a course of study according to a stated program for a given length of time, but for high attainments and proved ability to do research work in some special branch of knowledge, as determined by the various tests applied.

Before a student can be admitted to candidacy for the degree of Doctor of Philosophy he must give evidence that he has completed a liberal undergraduate course of academic study such as is required by colleges of good standing antecedent to the baccalaureate degree, and of such a character as to fit him to pursue to advantage researches in the field chosen for graduate work. The Faculty of Graduate Studies reserves the right to decide in all cases whether the antecedent training fulfills the requirements. The applicant may be credited with graduate work done at other universities, provided such work is shown to be of grade similar to that required here, but at least one year must be spent in residence at this University and the other requirements of the degree as prescribed must be fulfilled.

Candidates for the degree of Doctor of Philosophy shall offer themselves in three topics from the university subjects—one major and two collateral minor studies—the combination to be approved by the Faculty of Graduate Studies. These must be pursued under the guidance of a committee consisting of the professors in charge of the University, subjects in which the studies are pursued, with the professor in the major subject as chairman. This committee will determine his division of time, study, and research among the major and minor topics, but in general the major topic should be pursued during the whole time devoted to graduate work, and each minor topic during at least one year. The candidate shall pass satisfactory

examinations upon the three subjects selected. He must satisfy the professors of French and German within the first year of candidacy, that he can read understandingly, in the original, French and German works pertaining to his special field. In order to graduate the candidate must possess a broad acquaintance with his major topic and he must present a thesis which shall be a contribution to knowledge and which shall be accompanied by an adequate bibliography under the following regulations:

REGULATIONS REGARDING THESES.

Theses must be presented to the Dean not later than May 1 for graduation in June, or January 1 for graduation at the Winter Convocation.

After their acceptance, theses, with their accompanying drawings, are the property of the University, and must be deposited in the University archives, but authors are permitted to make copies. All theses must be typewritten on official thesis paper, which be obtained from the Assistant Treasurer of the University. No thesis for the degree of Doctor of Philosophy shall be submitted to the University Council until it has been approved by the professor having supervision of the major topic, and also by a co-referee to be appointed by the President's Council. The referees shall present to the Council written reports on the thesis to be filed therewith. The candidate is expected to print his thesis, under the supervision of the professor in charge of his major topic, within one year after the degree is granted, and shall present one hundred copies to the University, to be distributed among institutions of learning. The candidate must defend his thesis before a board of experts consisting of three specialists of university standing and established reputation in the subject represented by the principal topic, to be appointed by the President's Council.

DOCTORATE DISPUTATION.

A Doctorate Disputation was held publicly in University Hall, May 23, 1906. The theses that were successfully defended, the candidates, and the members of the boards of experts were as follows:

Thesis: Cranberry Diseases.

By CORNELIUS LOTT SHEAR, B.S., M.S., University of Nebraska.

Before FRANK H. KNOWLTON, Ph.D.

JOHN R. MOHLER, A.M., V.M.D.

MERTON B. WAITE, B.S.

Professor ALBERT MANN, Ph.D., presiding.

Thesis: The chemistry of different varieties and individual ears of sweet corn as affected by enzymes, climatic conditions, and breeding.

By MARTIN NORRIS STRAUGHN, B.S., Maryland Agricultural College; M.S., Columbian University.

Before EDWIN W. ALLEN, Ph.D.

HARRY J. PATTERSON, Ph.D.

CHARLES F. LANGWORTHY, Ph.D.

Prof. HARVEY W. WILEY, Ph.D., presiding.

The following Disputation was held at the same place on February 11, 1907:

Thesis: The effect of certain toxic solutions on nuclear and cell division in root tips of *Vicia faba*.

By WARNER W STOCKBERGER, B.S., Denison University.

Before THEODOR H. HOLM, Ph.D.

ALBERT F. WOODS, A.M.

CHARLES O. TOWNSEND, Ph.D.

Professor ALBERT MANN, Ph.D., presiding.

TOPICS FOR STUDY.

The topics and courses from which elections may be made are announced in the second and third sections of University Subjects, Department of Arts and Sciences, and in the similar sections of the curricula of the Departments of Medicine and Law, and of the College of the Political Sciences. In filling out application blanks the course must be given.

II. COLUMBIAN COLLEGE.

FACULTY.

CHARLES WILLIS NEEDHAM, LL.D.....	PRESIDENT OF THE UNIVERSITY
WILLIAM ALLEN WILBUR, A.M.....	Dean and Professor of English
JAMES HOWARD GORE, Ph.D.....	Professor of Mathematics
HOWARD LINCOLN HODGKINS, Ph.D.....	Professor of Physics
JAMES MACBRIDE STERRETT, A.M., D.D.....	Professor of Philosophy
CHARLES E. MUNROE, Ph.D.....	Professor of Chemistry
HERMANN SCHOENFELD, Ph.D., LL.D.....	Professor of German
CHARLES CLINTON SWISHER, Ph.D., LL.D.....	Professor of History
MITCHELL CARROLL, Ph.D.....	Professor of Classical Philology
GEORGE N. HENNING, A.M.....	Professor of Romance Languages
PERCY ASH, C.E.....	Professor of Architecture
C. WILLIAM A. VEDIEZ, Ph.D., LL.B.....	Professor of Economics
WILLISTON S. HOUGH, Ph.M.....	Professor of Philosophy
FRANK LEIGHTON DAY, Ph.D.....	Professor of Semitic Languages and Literatures
GEORGE P. MERRILL, Ph.D.....	Professor of Geology and Mineralogy
PAUL BARTSCH, Ph.D.....	Professor of Zoölogy
GEORGE LANSING RAYMOND, L.H.D.....	Professor of Æsthetics
ALBERT MANN, Ph.D.....	Professor of Botany
CHARLES SIDNEY SMITH, Ph.D.....	Assistant Professor of Greek and Latin
EDWIN A. HILL, Ph.D.....	Assistant Professor of Chemistry
THOMAS MALCOLM PRICE, Ph.D.....	Assistant Professor of Chemistry
PAUL NOBLE PECK, A.M.....	Assistant Professor of Mathematics
DE WITT C. CROISSANT, A.B.....	Assistant Professor of English
ALFRED F. W. SCHMIDT, A.M.....	Assistant Professor of German and Librarian
R. S. BASSLER, Ph.D....	Assistant Professor of Geology and Mineralogy
HARRIETT STRATTON ELLIS, A.B.....	Dean of Women and Instructor in English
F. L. MOLBY.....	Instructor in Freehand Drawing
*LEVI RUSSELL ALDEN, A.M.....	Instructor in History
OTIS D. SWETT, B.S.....	Instructor in Chemistry and Secretary
OSCAR L. KEITH, A.M.....	Instructor in Romance Languages
EDWIN VIVIAN DUNSTAN, B.S.....	Instructor in Civil Engineering and Graphics
JAMES FREDERICK PEAKE, A.M.....	Instructor in History
WALTER OTHEMAN SNELLING, M.S.....	Instructor in Chemistry
A. C. WILLARD, B.S.....	Instructor in Mechanical Engineering
EVERETT W. VARNEY, A.B.....	Instructor in Physics and Electricity

* Absent on leave.

GEORGE ALBERT ROSS, A.M.	Instructor in Mathematics
CHARLES B. NEWCOMER, Ph.D.	Instructor in Greek and Latin
WILLIAM HAMILTON, Ph.D.	Lecturer on History
EDWIN SMITH, JR., B.S.	Assistant in Assaying
WILLIAM E. HILLYER, M.S.	Assistant in Chemistry

The session of 1907-1908 begins Wednesday, September 25, 1907.

Columbian College is open to young men and young women. The courses of study in this department are conducted mainly in University Hall, corner Fifteenth and H streets, N. W. The office of the Dean of the College is in this building.

ADMISSION.

Every applicant for admission is required to present a testimonial of good character, and also a certificate of standing and regular dismissal from the school or college which he has attended or from the tutor with whom he has studied.

Candidates for admission to the Freshman Class may present certificates of admission or take an examination in the required subjects. Certificates, in lieu of any or all examinations, will be accepted from schools whose work is attested by well-prepared students admitted to the University in previous years, and from schools desiring coöperation with the University, that present evidence of affording adequate preparation in the required subjects. The Registrar of the University will, on application, furnish certificate blanks to the principals of such accredited schools.

The certificate of the College Entrance Examination Board will be accepted in so far as the subjects specified meet the requirements for admission.

The certificate of the Washington high schools covering all the requirements for admission admits students without examination to the courses of the Freshman year.

The certificates of all schools accredited to the University will be accepted in so far as they specially meet the requirements for admission.

The general requirement for admission is a four-year high school course, or its equivalent, consisting usually of four or five recitations per week in four or more topics. The high school studies which may be presented in satisfaction of the requirements of admission are given in the adjoining table, the unit being four or five recitations per week for one school year. The figures show the relative value of each subject. The list is substantially that set forth by the College Entrance Examination Board.

LIST OF PREPARATORY SUBJECTS FOR EXAMINATION

	Units.		Units.
English	4	History:	
Latin:		English	1
Elementary	2	American and Civil Gov-	
Advanced	2	ernment	1
Greek:		Mathematics:	
Elementary	2	Elementary Algebra	1
Advanced	1	Advanced Algebra	$\frac{1}{2}$
French:		Plane Geometry	1
Elementary	2	Solid Geometry	$\frac{1}{2}$
Advanced	2	Plane Trigonometry	$\frac{1}{2}$
Spanish	2	Physics	1
German:		Chemistry	1
Elementary	2	Botany	1
Advanced	2	Zoölogy	1
History:		Physiography	1
Ancient	1	Drawing	1
Mediæval and Modern.....	1	Shopwork	2

ADMISSION TO BACHELOR OF ARTS COURSES

Candidates for admission to the course leading to the degree of Bachelor of Arts are required to present subjects from the list of High School studies aggregating fifteen units, distributed as follows:

	Units.
English	4
Latin	4
{ Greek	3
or	
{ French or German.....	2
Elementary Algebra	1
Plane Geometry	1
Electives	2 or 3
	<hr/>
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ADMISSION TO BACHELOR OF SCIENCE COURSES.

Candidates for admission to the courses leading to the degree of Bachelor of Science are required to present subjects from the list of High School studies aggregating fifteen units, distributed as follows:

	Units.
English	4
French or German	2
Elementary Algebra	1
Plane Geometry	1
Physics	1
Chemistry	1
Electives	5
	<hr/> 15

EXAMINATIONS FOR ADMISSION.

The regular examination for admission to the Freshman Class is held in University Hall, corner of Fifteenth and H streets, N. W., during the week preceding the Commencement. The following is the schedule for the examination:

May 28, 1907.

Registration of Applicants at the Dean's office	8.30- 9.00
Latin; Drawing	9.00-11.00
Plane Geometry	11.00- 1.00
Elementary Algebra	2.00- 4.00

May 29.

Greek; Physics	9.00-11.00
Ancient History	11.00- 1.00
German	2.00- 4.00
French	4.00- 6.00

May 31.

Plane Trigonometry; Botany	9.00-11.00
English History	11.00- 1.00
English	2.00- 4.00

June 1.

Advanced Algebra; Zoölogy	9.00-11.00
Solid Geometry; Spanish	11.00- 1.00
Chemistry; Physiography	2.00- 4.00

Subjects offered for admission, but not named in the schedule of examinations, will be arranged for as occasion arises.

Unless admitted by certificate, every undergraduate candidate for a degree is required to pass an examination.

DEFINITION OF REQUIREMENTS.

ENGLISH.

(Counting four units.)

The requirement in English is that recommended by the Conference on Uniform Entrance Requirements in English.

NOTE—No candidate will be accepted in English whose work is notably defective in point of spelling, punctuation, idiom, or division into paragraphs.

a. **READING.** The form of examination will usually be the writing of a paragraph or two on each of several topics to be chosen by the candidate from a considerable number—perhaps ten or fifteen—given in the examination paper. The treatment of these topics is designed to test the candidate's power of clear and accurate expression, and will call for only a general knowledge of the substance of the books. *In every case knowledge of the book will be regarded as less important than the ability to write good English.* In preparation for this part of the examination, it is important that the candidate shall have been instructed in the fundamental principles of rhetoric.

Candidates should read the books prescribed for the year in which they propose to present themselves for this part of the examination.

In 1907 and 1908 the books prescribed for this part of the examination are as follows:

Shakespeare's *The Merchant of Venice* and *Macbeth*; *The Sir Roger de Coverley Papers* in the Spectator; Irving's *Life of Goldsmith*; Coleridge's *The Ancient Mariner*; Scott's *Ivanhoe* and *The Lady of the Lake*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Lowell's *The Vision of Sir Launfal*; George Eliot's *Silas Marner*.

In 1909, 1910, and 1911 ten books, selected as prescribed below from the following list, are to be offered for examination:

Group I (two to be selected).

Shakespeare's *As You Like It*, *Henry V*, *Julius Caesar*, *The Merchant of Venice*, *Twelfth Night*.

Group II (one to be selected).

Bacon's *Essays*; Bunyan's *The Pilgrim's Progress, Part I*; *The Sir Roger de Coverley Papers* in the Spectator; Franklin's *Autobiography*.

Group III (one to be selected).

Chaucer's *Prologue*; Spenser's *Faerie Queene* (selections); Pope's *The Rape of the Lock*; Goldsmith's *The Deserted Village*; Palgrave's *Golden Treasury (First Series)*, Books II and III, with especial attention to Dryden, Collins, Gray, Cowper and Burns.

Group IV (two to be selected).

Goldsmith's *The Vicar of Wakefield*; Scott's *Ivanhoe*; Scott's *Quentin Durward*; Hawthorne's *The House of the Seven Gables*; Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; Dickens' *A Tale of Two Cities*; George Eliot's *Silas Marner*; Blackmore's *Lorna Doone*.

Group V (two to be selected).

Irving's *Sketch Book*; Lamb's *Essays of Elia*; De Quincey's *Joan of Arc* and *The English Mail Coach*; Carlyle's *Heroes and Hero Worship*; Emerson's *Essays* (selected); Ruskin's *Sesame and Lilies*.

Group VI (two to be selected).

Coleridge's *The Ancient Mariner*; Scott's *The Lady of the Lake*; Byron's *Mazeppa* and *The Prisoner of Chillon*; Palgrave's *Golden Treasury* (First Series), Book IV, with especial attention to Wordsworth, Keats, and Shelley; Macaulay's *Lays of Ancient Rome*; Poe's *Poems*; Lowell's *The Vision of Sir Launfal*; Arnold's *Sohrab and Rustum*; Longfellow's *The Courtship of Miles Standish*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Evelyn Hope*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *The Boy and the Angel*, *One Word More*, *Harvé Riel*, *Phœdippides*.

b. STUDY AND PRACTICE. This part of the examination presupposes the thorough study of each of the works named below. The examination will be upon subject-matter, form, and structure. In addition, the candidate may be required to answer questions involving the essentials of English grammar, and questions on the leading facts in those periods of English literary history to which the prescribed works belong.

The books set for this part of the examination will be:

1907, 1908: Shakespeare's *Julius Caesar*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*; Burke's *Speech on Conciliation with America*; Macaulay's *Essay on Addison and Life of Johnson*.

1909, 1910, 1911: Shakespeare's *Macbeth*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*; Burke's *Speech on Conciliation with America*, or Washington's *Farwell Address* and Webster's *First Bunker Hill Oration*; Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

LATIN.

The minimum requirements in Latin and Greek are in substantial agreement with those of the College Entrance Examination Board, which carry out the recommendations of the Committee of Twelve of the American Philological Association:

The Elementary Requirement (counting two units).

- a. i. Latin Grammar: The inflections; the simpler rules for composition and derivation of words; syntax of cases and the verbs; structure of sentences in general, with particular regard to relative and conditional sentences, indirect discourse, and the subjunctive; so much prosody as relates to accent, versification in general, and dactylic hexameter.
- ii. Latin Prose Composition: Translation into Latin of detached sentences and easy continuous prose based upon Cæsar.
- b. Cæsar: Any four books of the Gallic War, preferably the first four, or their equivalent.

The Advanced Requirement (counting two units).

- a. Cicero: Any six orations from the following list, but preferably the first six mentioned:
The four orations against Catiline, Archias, the Manilian Law, Marcellus, Roscius, Milo, Sestius, Ligarius, the Fourteenth Philippic.
- b. Vergil: The first six books of the *Æneid*.
- c. Advanced Prose Composition, consisting of continuous prose of moderate difficulty based on Cicero.
- d. Sight Translation, based on prose of no greater difficulty than the easier portions of Cicero's orations.

GREEK.

The Elementary Requirement (counting two units).

- a. i. Greek Grammar: The topics for the examination in Greek grammar are similar to those detailed under Latin grammar.
- ii. Greek Prose Composition, consisting principally of detached sentences to test the candidate's knowledge of grammatical constructions.

The examination in grammar and prose composition will be based on the first two books of Xenophon's *Anabasis*.

- b. Xenophon: The first four books of the *Anabasis*.

The Advanced Requirement (counting one unit).

- a. Homer: The first three books of the *Iliad* (omitting II, 494, to end).
- b. Sight Translation, based on prose of no greater difficulty than Xenophon's *Anabasis*.

FRENCH.

Elementary (counting two units). Candidates in Elementary French must have a good knowledge of the essential parts of grammar, with stress on pronouns and on regular verbs and the common irregular

verbs. They must know the principles of pronunciation; must be able to translate simple English sentences or easy connected prose into French, and to translate accurately ordinary modern French prose. Candidates must have translated not less than 450 duodecimo pages by at least four different authors, of which amount at least one-third must be history. Candidates must have had a two-years' course of at least four periods per week.

Advanced (counting two units). Candidates in Advanced French must have partly translated, partly read, in addition to the requirements for Elementary French, at least 1,000 pages of difficult French of several different authors, including history, fiction, drama, and poetry. Candidates must have had a four-years' course of at least four periods per week.

Fraser and Squair's French Grammar or Grandgent's Essentials of French Grammar is recommended.

SPANISH.

(Counting two units.)

Candidates in Spanish must have a good knowledge of grammar, including syntax, with stress on pronouns and verbs, regular and irregular. They must know the principles of pronunciation. They must be able to translate simple English sentences or easy connected prose into Spanish, and to translate accurately fairly difficult modern Spanish prose and verse. Candidates must have translated not less than 500 pages by at least four different authors, of which amount at least one-fourth must be history or drama. Candidates must have had a two-years' course of at least four periods per week.

GERMAN.

Elementary (counting two units). Candidates in Elementary German must have had a two-years' course of at least four periods a week. They must be able to read fluently at sight and to translate easy narrative prose and poetry. An accurate knowledge of an elementary German grammar is requisite, to be tested by the translation into German of some fifteen sentences. About 300 pages of graduated narrative prose, one short play, and such poetry as is usually found in a First Reader will be considered an adequate preparation.

Advanced (counting two units). Candidates in Advanced German must have had a four-year's course of at least four periods a week. They should be well trained in the syntactical laws of the language, have read about 800 pages of good literature in prose, preferably such prose works as are given in the Report of the Committee of Twelve of the Modern Language Association, and poetry, especially dramas by Les-

sing, Schiller, and Goethe, and studied an elementary history of German literature. German composition should comprise a number of short themes upon assigned historical or literary topics, lives of the authors read, etc.

HISTORY.

In this subject special importance is attached to preparation in geography.

Ancient (counting one unit).

a. Greek History, through the Roman Conquest; as much as is contained in Myer's History of Greece.

b. Roman History; as much as is contained in Allen's History of the Roman People.

Medieval and Modern European History (counting one unit). As much as is contained in Myer's History of Medieval and Modern Europe.

English History (counting one unit). As much as is contained in Larned's History of England.

American History with the Elements of Civil Government (counting one unit). As much as is contained in Fiske's History of the United States, and Fiske's Civil Government.

MATHEMATICS.

Elementary Algebra (counting one unit).

i. Algebra to Quadratics:

The four fundamental operations for rational algebraic expressions, factoring, highest common factor, lowest common multiple, complex fractions, the solution of equations of the first degree containing one or more unknown quantities, radicals, including the extraction of the square root of polynomials and numbers, and fractional and negative exponents.

ii. Quadratics, etc.:

Quadratic equations and equations containing one or more unknown quantities that can be solved by the methods of quadratic equations, problems depending upon such equations, ratio and proportion, and the binomial theorem for positive integral exponents.

Advanced Algebra (counting one-half unit).

i. Progressions, etc.:

The progressions, the elementary treatment of permutations and combinations, and the use of four and five place tables and logarithms.

ii. Series, etc.:

Undetermined coefficients, the elementary treatment of infinite series, the binomial theorem for fractional and negative exponents, and the theory of logarithms.

iii. Theory of equations.

Determinants and the elements of the theory of equations, including Horner's method for solving numerical equations.

Plane Geometry (counting one unit).

The solution of simple original exercises and numerical problems.

Solid Geometry (counting one-half unit).

Properties of straight lines and planes, of dihedral and polyhedral angles, of projections, of polyhedrons, including prisms, pyramids, and the regular solids; of cylinders, cones, and spheres, of spherical triangles, and the measurement of surfaces and solids.

Plane Trigonometry (counting one-half unit).

The definitions and relations of the six trigonometrical functions as ratios, proof of important formulæ, theory of logarithms and use of tables, solution of right and oblique plane triangles.

PHYSICS.

(Counting one unit.)

It is recommended that the candidate's preparation should include:

- a. Individual laboratory work, comprising at least thirty-five exercises well distributed over the subjects of physics.
- b. Instruction by lecture-table demonstrations.
- c. The study of at least one standard text-book, supplemented by the use of many and varied numerical problems. The metric system should be familiar to the student.

The laboratory note book must be submitted for inspection, whether the candidate is admitted on certificate or by examination.

CHEMISTRY.

(Counting one unit.)

The candidate's preparation in chemistry should include:

- a. Individual laboratory work, comprising at least forty experiments of a character analogous to those set forth by the College Entrance Examination Board.

On application for admission to this University, every candidate seeking credit in chemistry must present an indexed note book in which he has recorded the steps and the results of his laboratory exercises, bear-

ing an endorsement of the teacher who directed the student, written in ink on the inside of the cover.

b. Instruction by lecture-table demonstrations to be used in instructing the student as to methods of manipulation and as a basis for questioning him upon the general principles involved in his laboratory experiments.

c. The study of at least one modern text-book, to the end that the student may gain a comprehensive and connected view of the most important facts and laws of elementary chemistry.

Requirements. The ground to be covered should include the following: The chief physical and chemical characteristics, the isolation and the recognition of the following elements and the preparation and study of their principal compounds: *Oxygen, hydrogen, carbon, nitrogen, chlorine, bromine, iodine, fluorine, sulphur, phosphorus, silicon, potassium, sodium, calcium, magnesium, zinc, copper, mercury, silver, aluminum, lead, tin, iron, manganese, chromium.*

The more detailed study should be confined to the italicized elements (as such) and to a restricted list of compounds, such as water, hydrochloric acid, carbon monoxide, carbon dioxide, oxides of nitrogen, nitric acid, ammonia, sulphur dioxide, sulphuric acid, hydrogen sulphide, sodium hydroxide, ammonium hydroxide.

Attention should be given to the atmosphere (constitution and relation to animal and vegetable life) flame, acids, bases, salts, oxidation and reduction, crystallization, combining proportions by weight and volume, calculations founded on these and on Boyle's and Charles' laws, symbols, formulas, equations and nomenclature, atomic theory, atomic weights, nascent state, natural groupings of the elements solution (solvents and solubility of gases, liquids, and solids), strength of acids and bases, conservation and dissipation of energy, chemical energy and electrolysis, and of valence, electrolytic dissociation, osmosis, mass action in a very elementary way. Chemical terms should be clearly understood, and the student should be able to illustrate and apply the ideas that they embody. The theoretical topics are not intended to form separate subjects of study, but to be taught only so far as is necessary for the correlation and explanation of the experimental facts. The facts should be given as examples from various classes and not as isolated things.

BOTANY.

(Counting one unit.)

Candidates must have had at least one year's full work in botany, comprising the general principles of morphology, physiology, and ecology, as well as the natural history of plant groups and classification. Bergen's Foundations of Botany and Atkinson's Elementary Botany indicate the general scope of the work required.

ZOÖLOGY.

(Counting one unit.)

In general, zoölogy is not recommended as an entrance subject unless the subject has been preceded or accompanied by that of physics and chemistry, which form the most desirable groundwork for collegiate courses in biology. The entrance examination in zoölogy is designed to test, first, the candidate's practical acquaintance with the natural history, structure, and relationships of some of the leading types of animals, and, second, his knowledge of the more essential facts of physiology.

Practical Zoölogy. A practical examination of at least ten common animal types, and the presentation by the candidate of a laboratory note book, certified by the teacher, as evidence of a laboratory course actually performed. Examples of the types suggested are the frog, fish, mollusk, insects, crustaceans, annelid, starfish, hydroid (hydra), and protozoan. In the examination less weight is laid on a knowledge of anatomical minutiae than on the ability to recognize the specimen and its allies, to indicate its relationship, and to point out the leading features of its life history, organization, and physiology.

Elementary Physiology. The nature of foods and their history in the body; the essential facts of digestion, absorption, circulation, secretion, excretion and respiration; the motor, nervous, and sensory functions, and the structure of the various organs by which these operations are performed. Martin's *Human Body* (briefer course) forms a suitable basis for this work, but teachers are recommended as far as possible to correlate the physiology of man and the higher animals with that of the lower forms studied in the course of practical zoölogy.

PHYSIOGRAPHY.

(Counting one unit.)

The equivalent of Davis' *Physical Geography* is required, together with an approved laboratory and field course of at least forty exercises actually performed by the candidate.

The candidate will be required to present at the time of his examination the original note book in which he recorded, with dates, the steps and results of his laboratory exercises. This book, which should contain an index of subjects, must bear the endorsement of the teacher, certifying that it is a true record of the candidate's work.

DRAWING.

(Counting one unit.)

The candidate's preparation in drawing should include simple geometrical plane, and solid figures and simple pieces of machinery, with

a fair knowledge of the rules of perspective and light and shade as applied in freehand sketching. The candidate should be able to reproduce from a flat copy with enlargement or reduction of size.

For courses in architecture, the preparation should include, in addition to the above, the drawing of simple pieces of architectural ornament (a Greek anthemium, a design of iron scrollwork, etc.).

For courses in engineering the preparation should include the copying of machinery details.

For courses in general science or in science for teachers, the preparation should include the copying of still life and simple plant forms.

SHOPWORK.

Candidates who have been trained in manual-training schools or in commercial shops in the use of tools and in the ordinary processes employed in the working of wood or metal may receive admission credits for such work. They should submit letters from their teachers or employers, stating the character of the work in which they have been trained and the time given to it. The amount of credit will vary according to circumstances, but it will not exceed two units.

ADMISSION TO ADVANCED STANDING.

Candidates for admission to advanced classes in any department are examined in all indispensable preliminary studies.

Due credit is given for properly certified courses of study pursued in other colleges and universities.

ADMISSION TO SPECIAL COURSES.

All the courses of instruction are open to students of suitable age and attainments who wish, without reference to any degree, to pursue special studies. Candidates must show that they are familiar with the subjects preliminary to the studies which they wish to pursue.

REQUIREMENTS FOR DEGREES.

The undergraduate degrees offered by Columbian College are Bachelor of Arts and Bachelor of Science. To be recommended for either of these degrees, the student must be registered for at least one academic year, must satisfy the admission requirements, and must complete at least sixty hours of undergraduate courses with the requisite grades.

The studies to be taken by a student during his college course, while largely elective, should be chosen with careful attention to their relation to each other and to his aims and purposes for the future. In general, the courses to be taken during the early years are those given

under the first section in University Subjects, while courses under the second section are elected during the latter part of the course. No time limit is prescribed and the degree is given when the total of prescribed and elective courses is completed.

BACHELOR OF ARTS COURSE

To be recommended for the degree of Bachelor of Arts, the student must complete courses of study aggregating at least sixty units. The unit of credit is one hour of recitation or lecture work per week for one academic year. Laboratory hours in Chemistry and in Architecture count one-third unit each, in other subjects one-half unit each. Fifteen units are of prescribed studies and forty-five are electives. The prescribed studies are the following:

	Units.
English	3
Mathematics	3
Latin or Greek	3
French or German	3
Philosophy	3

BACHELOR OF SCIENCE COURSES.

General Course for the Degree of Bachelor of Science

To be recommended for the degree of Bachelor of Science, the student must complete courses of study aggregating at least sixty units. The unit of credit is one hour of recitation or lecture work per week for one academic year. Laboratory hours in Chemistry and in Architecture count one-third unit, in other subjects one-half unit each. Fifteen units are of prescribed studies and forty-five are electives. The prescribed studies are the following:

	Units.
English	3
Mathematics	3
French or German	3
Sciences	6

For the Degree of Bachelor of Science in Chemistry

Freshman Year.

	Units.		Units.
Chemistry, 1, 2	5	French or German.....	3
English, 1, 9, or 2, 10.....	3	Graphics, 1	2
Mathematics, 3, 5, 7, or 6, 8, 10.	3		

Sophomore Year.

	Units.		Units.
Chemistry, 3 20.....	5	Mathematics, 9, 11, or 12, 14..	3
French or German.....	3	Physics, 1, 2.....	5

Junior Year.

Architecture, 1	1	Graphics, 2	2
Chemistry, 4, 21, 23.....	6	Geology, 1	2
French or German.....	3		

Senior Year.

Chemistry, 6, 24, 25, 27.....	11	Geology, 2	2
Economics or History	2	Electives	2

COMBINED COURSES.

The regular courses in Columbian College are so correlated with the courses in Law and in Medicine that both the Bachelor's degree in the college and the professional degree may be obtained in a period of six years.

PRIZES.

Only candidates for degrees may compete for these prizes.

STAUGHTON AND ELTON PRIZES.—The Staughton Prize, for excellence in the Latin Language and Literature, and the Elton Prize, for excellence in the Greek Language and Literature, founded by the Rev. Romeo Elton, D.D., of Exeter, England, consist of two gold medals, annually awarded to the best scholar in each of these languages.

RUGGLES PRIZES.—The Ruggles Prizes, for excellence in Mathematics, founded by Professor William Ruggles, LL.D., consist of two gold medals, annually awarded upon examination to the best two scholars in Mathematics.

MUNROE PRIZE.—Professor Munroe offers a gold medal to that student from any Washington high school or the Manual Training School who shall attain the highest mark in Chemistry among those passing the entrance examinations, and shall remain in regular attendance for one year.

CLASS OF '06 JAMES MACBRIDE STERRETT, JR. MEMORIAL MEDAL.—This prize is annually awarded to that student taking Course 1 in Physics who obtains the highest average in a special examination on a given subject and in the writing of an essay on an assigned topic.

DAVIS PRIZES.—The Davis Prizes, for excellence in Elocution, founded by the Hon. Isaac Davis LL.D., of Massachusetts, consist of three gold medals, annually awarded to the successful competitors in a public contest. Only members of the Senior Class are eligible to compete for these prizes.

DAUGHTERS OF THE AMERICAN REVOLUTION PRIZES.—These prizes, founded by the Daughters of the American Revolution of the District of Columbia, consist of two gold medals, awarded annually to the two students in the graduating class who, having maintained a high standing in the regular courses in Mediæval, Modern, European, English, and American History during three years, shall produce the best essays upon an assigned topic of American history.

THOMAS F. WALSH PRIZE IN IRISH HISTORY.—This prize is a gold medal, awarded to that student in the graduating class who, having maintained a high standard in the regular courses of Mediæval, Modern, European, American, and English History, shall produce the best essay based upon the study of some period of Irish history.

E. K. CUTTER PRIZE.—The E. K. Cutter Prize in English was founded by the late Marion Kendall Cutter. The endowment is a fund of one thousand dollars, the income of which is given annually as a prize "for excellence in the study of English." The prize will be awarded to that member of the graduating class whose record in English, combined with general excellence, shows most marked aptitude and attainment in English studies.

WILLIE E. FITCH PRIZE.—The Willie E. Fitch Prize, for highest excellence in all branches of Chemistry, founded by James E. Fitch, Esq. in memory of his son, consists of fifty dollars, which is awarded annually for the best examination in Chemistry.

OLD AND MIDDLE ENGLISH PRIZE.—This is a prize of twenty-five dollars awarded to the student showing the greatest proficiency in English 21 and 30.

PRIZE AWARDS, 1905-06.

Staughton Prize	Louise Jane Smith
Elton Prize	William Webb Sniffin
Ruggles Prize	Katherine Harrington
Munroe Prize	Loren Heinlein Call
Class of '06 James Macbride Sterrett, Jr.	
Memorial Medal	Bertha Birtwell
Davis Prizes.....	First Prize: Clara Velma Barber
	Second Prize: Adon Daniel Phillips
	Third Prize: Charlotte Reinke
Daughters of the American	
Revolution Prizes	Ada Belle Burgdorf
	Ethel Hanna McCleary
Thomas F. Walsh Prize.....	Katherine Harrington
E. K. Cutter Prize	Rhoda Watkins
Schmidt Prize	Ara Marcus Daniels, Jr.
Muth Prize	Richard Bragaw

SCHOLARSHIPS.

Applications for scholarships should be filed with the Dean not later than September fifteenth. All scholarships except the Kendall Scholarship and the University Scholarships are awarded for one year only, but they may be renewed. Any student holding a scholarship who fails to obtain a general average of 85 per cent on the work of any term or whose deportment is unsatisfactory will be reported to the President's Council, and in the absence of extenuating circumstances the scholarship will be revoked.

KENDALL SCHOLARSHIP.—The Kendall Scholarship, founded by the late Hon. Amos Kendall, is annually conferred on that student from any of the Washington High Schools or from the Manual Training Schools who attains the highest average in the May entrance examinations. This scholarship continues throughout the undergraduate course, and the student holding it pays only the matriculation, library, laboratory, and graduation fees.

UNIVERSITY SCHOLARSHIPS.—The University offers also six scholarships, each continuing throughout the undergraduate course, to be awarded annually to members of the graduating classes of the high schools of Washington and of the Manual Training School. The scholarships will be divided among the several schools in proportion to the number of students in attendance upon each. Three scholarships are offered to young men and three to young women. No scholarship will be awarded to a candidate whose examination average is below 80 per cent. Candidates for these scholarships will take the May entrance examinations for the undergraduate course leading to the degree of Bachelor of Arts or the degree of Bachelor of Science, as they shall elect, and on the results of these examinations the scholarships will be assigned. Holders of these scholarships will be expected to pursue a regular course in the Department of Arts and Sciences leading to a degree. Such students will pay only the matriculation, library, laboratory, and graduation fees.

DAVIS SCHOLARSHIP.—This is the income of a fund of one thousand dollars given to the University in October, 1809, by Hon. Isaac Davis, of Massachusetts.

MARY LOWELL STONE SCHOLARSHIP.—This scholarship was founded by a woman in memory of a woman student of science. It consists of a fund of two thousand dollars, the income from which is to be paid to needy women students of science in the University; it will be awarded by the President's Council.

MARIA M. CARTER SCHOLARSHIP.—This is the income of a fund of one thousand dollars given to the University in 1871 by Mrs. Maria M. Carter.

FARNEHAM SCHOLARSHIP.—This is the income of a fund of one thousand dollars given to the University in 1871 by Mrs. Robert Farnham.

ADMIRAL POWELL SCHOLARSHIPS.—The Admiral Powell Scholarships were founded by the late Admiral Powell, U. S. Navy. The income from this endowment is for the "free education of such young men as may desire to take advantage of the said endowment by way of their preparation for entrance into the Naval Academy at Annapolis, Maryland, or such as may fit them to become mates or masters in the Merchant Marine Service of the United States," and of "such apprentices as, having filled their time in the great steam manufactory establishments of the country, may apply for appointment from civil life in the Steam Engineer Department of the United States Navy." The number of scholarships awarded each year will be determined by the income from the endowment. Each scholarship will entitle the beneficiary to free tuition for one year. Such special courses of study are offered to each student as will give him the instruction needed to accomplish the purpose for which he is awarded the scholarship.

These scholarships are especially applicable to those who intend to come up for examination as warrant officers in the Engineer Department of the Navy, or to those who desire to fit for responsible positions in the mercantile marine.

The subjects to be taken by a student will vary according to his preparation and according to the purpose for which he has been awarded the scholarship, but a year's work can be selected from the following topics:

	Hours.
Navigation and Nautical Astronomy	6
Algebra and Geometry	3
Trigonometry	1½
Mechanical and Machine Drawing	4
Meteorology	2
English	3
French	3
German	3
Spanish	3
International Law	1
Commercial Geography	1
Admiralty Law	1½
Boilers and Power Plants	3
Measurement of Power	3
Dynamo theory	2
Dynamo testing	3

DAVIS PRIZE SPEAKING.

The Davis Prize Speaking is held in University Hall on the Wednesday after the Easter holidays. The Davis Prizes were founded by Hon. Isaac Davis, of Massachusetts, in 1847. The original endowment was five hundred dollars, "proceeds of which will afford three premiums, in cash or gold medals, of the value of \$5, of \$10, and of \$15 annually—these premiums or prizes to be distributed annually to such members of the Senior Class as shall have made the greatest progress in elocution since their connection with the College."

The award of these three prizes is determined by a public speaking contest, in which the participants deliver original orations. Senior students wishing to enter the competition should report to the Dean of the College not later than five weeks before the contest, and submit their orations not later than three weeks before the contest. The prizes are awarded by a committee consisting of three members, selected by the College Faculty.

DEAN OF WOMEN.

The Dean of Women has general oversight of the women students. She will assist them to find desirable boarding places and associations in the city. She will advise them in all College matters excepting those pertaining to the educational and general administrative functions of the Dean. She may be consulted in her office at all times and she will exercise supervision over the social activities of the women students.

ENOSINIAN SOCIETY.

The Enosinian Society, a literary association formed by the students of Columbian College, to which any University student is eligible, meets regularly for the purpose of improvement in debate and composition.

This society had its beginning March 6, 1822, during the first session of Columbian College, when a number of students held a meeting "for the purpose of establishing a debating society." Two Enosinian prizes are given annually and are publicly delivered at the Commencement. They are the following:

DEBATERS' PRIZE.—A gold medal given by the Society for proficiency in debate. This prize was awarded in 1906 to Clarence Willard Whitmore.

GORE PRIZE IN PARLIAMENTARY LAW.—A gold medal given by Prof. James Howard Gore for proficiency in parliamentary law. This prize was awarded in 1906 to Karl Morgan Block.

THE CHRISTIAN ASSOCIATION.

The student movement in Association work is represented by the Young Men's Christian Association of The George Washington University, which was organized in the fall of 1905. The Association plans and conducts religious work among the men of the University. The Association calendar includes Bible study clubs, a weekly chapel service, and occasional men's meetings.

Similar lines of religious work are conducted among the women students by the Young Women's Christian Association of Columbian College.

THE COLLEGE CHAPEL.

Chapel services are conducted in West Hall on Monday, Tuesday, Thursday, and Friday mornings throughout the academic year, at 9 o'clock. The College Chapel is conducted by the Faculty, and all students are invited to help sustain the service. On Wednesdays, at 12 o'clock, the College students participate in the University Assembly, which is held in University Hall.

The Dean of the College will confer with students on questions concerning their welfare and will co-operate with them in furthering the ethical and religious interests of the College.

Official announcements are made regularly at the University Assembly, and professors and students are expected to be governed by them.

III. WASHINGTON COLLEGE OF ENGINEERING.

FACULTY.

CHARLES WILLIS NEEDHAM, LL.D.	PRESIDENT OF THE UNIVERSITY
HOWARD LINCOLN HODKINS, Ph. D.	Dean and Professor of Physics
JAMES HOWARD GORE, Ph.D.	Professor of Mathematics
HERMANN SCHOENFELD, Ph.D., LL.D.	Professor of German
CHARLES E. MUNROE, Ph.D.	Professor of Chemistry
WILLIAM ALLEN WILBUR, A.M.	Professor of English
GEORGE N. HENNING, A.M.	Professor of Romance Languages
PERCY ASH, C.E.	Professor of Architecture
GEORGE P. MERRILL, Ph.D.	Professor of Geology and Mineralogy
C. WILLIAM A. VEDITZ, Ph.D., LL.B.	Professor of Economics
EDWARD ADAMS MUIR, B.S.	Assistant Professor of Graphics
PHILANDER BETTS, E.E.	Assistant Professor of Electrical Engineering
EDWIN A. HILL, Ph.D.	Assistant Professor of Chemistry
R. S. BASSLER, Ph.D.	Assistant Professor of Geology
PAUL NOBLE PECK, A.M.	Assistant Professor of Mathematics
DE WITT C. CROISSANT, A.B.	Assistant Professor of English
ALFRED F. W. SCHMIDT, A.M.	Assistant Professor of German
F. L. MOLBY.	Instructor in Freehand Drawing
OTIS D. SWETT, B.S.	Instructor in Chemistry
OSCAR L. KEITH, A.M.	Instructor in Romance Languages
EDWIN V. DUNSTAN, C.E.	Instructor in Civil Engineering
OSCAR A. MECHLIN, C.E.	Instructor in Civil Engineering
ARTHUR CUTTS WILLARD, B.S.	Instructor in Mechanical Engineering
EVERETT W. VARNEY, A.B.	Instructor in Physics and Electricity
THOMAS F. J. MAGUIRE, B.S.	Instructor in Electrical Engineering
GEORGE A. ROSS, A.M.	Instructor in Mathematics
WALTER OTHEMAN SNELLING, M.S.	Instructor in Chemistry
WILLIAM E. HILLYER, M.S.	Assistant in Chemistry

The session of 1907-1908 begins Wednesday, September 25, 1907

The main building of the University, in which the general studies in this department are conducted, is University Hall, corner Fifteenth and H streets, N. W. The office of the Dean of the College is in this building.

ADMISSION.

Every applicant for admission is required to present a testimonial of good character, and also a certificate of standing and regular dismissal from the school or college which he has attended or from the tutor with whom he has studied.

Candidates for admission to the Freshman Class may present certificates of admission or take an examination in the required subjects. Certificates, in lieu of any or all examinations, will be accepted from schools whose work is attested by well-prepared students admitted to the University in previous years, and from schools desiring cooperation with the University, that present evidence of affording adequate preparation in the required subjects. The Registrar of the University will, on application, furnish certificate blanks to the principals of such accredited schools.

The certificate of the College Entrance Examination Board will be accepted in so far as the subjects specified meet the requirements for admission.

The certificate of the Washington high schools covering all the requirements for admission admits students without examination to the courses of the Freshman year.

The certificates of all schools accredited to the University will be accepted in so far as they specially meet the requirements for admission.

The general requirement for admission is a four year high school course, or its equivalent, consisting usually of four or five recitations per week in four or more topics. The high school studies which may be presented in satisfaction of the requirements of admission are given on pages 39-47 of this Catalogue.

Candidates for admission to the Freshman Class in the College of Engineering are required to present fifteen units for admission, distributed as follows:

	Units.
English	4
French or German	4
Plane and Solid Geometry	1½
Elementary and Advanced Algebra	1½
Plane Trigonometry	½
Chemistry	1
Physics	1
Electives	1½

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NOTE.—The modern language requirement may be satisfied by presenting four units in one language, or two units in French and two units in German. Students who present four units in one language will study the other language two years in College. Students who present two units in French and two units in German will study each language one year in College.

ADMISSION TO ADVANCED STANDING.

Candidates for admission to advanced classes in any department are examined in all indispensable preliminary studies.

Due credit is given for properly certified courses of study pursued in other colleges and universities.

ADMISSION TO SPECIAL COURSES.

All the courses of instruction are open to students of suitable age and attainments who wish, without reference to any degree, to pursue special studies. Candidates must show that they are familiar with the subjects preliminary to the studies which they wish to pursue.

COURSES FOR A DEGREE.

Three courses of study are offered:

I. CIVIL ENGINEERING.

II. ELECTRICAL ENGINEERING.

III. MECHANICAL ENGINEERING.

These courses occupy four years each, and lead to the degree of Bachelor of Science in Civil Engineering, in Electrical Engineering, and in Mechanical Engineering, respectively. Graduate courses of one year under the Faculty of Graduate Studies of the George Washington University are open to those who receive the above degrees, and lead, respectively, to the degrees of Civil Engineer, Electrical Engineer, and Mechanical Engineer.

The courses in engineering are planned to give the student a thorough understanding of the theory underlying engineering practice, and such a practical knowledge of the instruments and methods of his particular profession as will enable him to apply the theory properly. In all the courses a thorough training in mathematics, pure and applied, and in drawing and descriptive geometry is required as the basis of the analytical and graphical study of engineering topics. Much stress is laid on the work in the drawing-room and laboratory. The work is planned to give him a thorough knowledge of principles upon which he may build, and by which he may be able to solve the new problems he meets in practice.

The work of the first year is the same for all students. It is taken up partly with general studies which have both an educational and a cultural value, and partly with work in mathematics and drawing which lays the foundations for the subsequent courses. In each of the other years there are studies taken in common by all engineering students, these studies including courses in English, in French and German, in

pure and applied mathematics, in drawing and descriptive geometry, in chemistry and in physics. The requirement in French and German is intended to give the student an accurate reading knowledge of these languages, with particular reference to scientific literature.

Beginning with the Sophomore year, the Civil Engineering student enters upon his technical studies, continuing at the same time a number of topics of a more general character, and in the Junior and Senior years the work becomes yet more specialized. He begins with a general course in surveying and follows this with courses in railroad and highway location and construction. Theoretical hydraulics and hydraulic engineering receive careful and detailed treatment and much stress is laid on sanitary work, both in its theory and applications. A preliminary course in engineering materials and simple constructions in the Sophomore year is followed in later years by extended courses in mechanics of materials, and in the theory and design of structures in wood, steel, and masonry, in which are applied the knowledge gained in the courses in mechanics and graphic statics.

The courses for Electrical and Mechanical Engineering students are the same during the Sophomore year, and beside the general studies required of all engineering students include courses in advanced drawing and design and in kinematics of machinery. Shopwork begins in this year and continues until the end of the course for both classes of students, although the Electrical students give less time to it than do the Mechanical students. The purpose of the work is not primarily to give manual skill, but to give such an understanding of tools and processes as will be of assistance in designing and in superintending. In the Junior Year Electrical and Mechanical students continue work in machine design, and take courses in steam engineering and on boilers and power plants.

The Electrical students begin their special work in electricity in the Junior year. Theoretical electricity is first studied, and is followed by engineering electricity, and by courses on direct current machinery. In the laboratory, experimental work in exact measurements is followed by the study of the dynamo. In the drawing-room are studied related problems in design. In the Senior year alternating current machinery is studied, both theoretically and practically; and courses on the applications of electricity and on light and power distribution are taken. Many hours are given to work in the electrical and general engineering laboratories.

The Mechanical Engineering students, in addition to the courses which they take in common with the electrical students, have courses in engine design, including steam and gas engines; in hydraulics and hydraulic

machinery; and a course in electrical engineering, considering electrical machinery from the standpoint of one who is to use it rather than to design it.

The engineering courses are partly lecture and partly laboratory and drawing-room courses, the plan being to give the theory in the class-room, to illustrate the theory in the laboratory, and to have the student apply the theory, from given data, in the drawing-room.

REQUIREMENTS FOR A DEGREE.

The arrangement of the topics in each of the regular courses for a degree is shown below. The numbers following the names of subjects refer to the courses as given in the list of University Subjects on pages 76 to 120, to which reference should be made for more complete description.

COMMON TO ALL COURSES.

Freshman Year.

	Units.
Chemistry, 1, 7	5
General Chemistry and Qualitative Analysis.	
English, 1, 9 or 2, 10.....	3
Rhetoric, Logic, and Psychology.	
French or German	3
Graphics, 1	2
Mechanical and Freehand Drawing.	
Mathematics, 9, 11 or 12, 14.....	3
Trigonometry; Analytic Geometry.	

CIVIL ENGINEERING COURSE.

Sophomore Year.

	Units.
Civil Engineering, 1, 4.....	5
Surveying; Materials of Construction.	
French or German	3
Graphics, 8, 10	4
Descriptive Geometry; Topographic Drawing.	
Mathematics, 20, 22 or 21, 22	3
Calculus; Differential Equations.	
Physics, 1, 2	5
General Physics; Laboratory Physics.	

Junior Year.

	Units.
Applied Mathematics, 20, 21, 22	6
Mechanics; Hydraulics; Mechanics of Materials.	
Astronomy	1
Civil Engineering, 2, 3, 7, 22	9½
Railroad Engineering; Highway Engineering; Engineering Testing; Theory of Structures.	
Electrical Engineering, 6	1
Industrial Engineering.	
Geology	2

Senior Year.

Chemistry, 6	1
Metallurgy.	
Civil Engineering, 20, 21, 23, 24	16
Masonry; Hydraulic Engineering; Theory of Structures; Sanitary Engineering.	
Contracts and Business Law	2
Mechanical Engineering, 12	2
Steam Engineering.	

ELECTRICAL ENGINEERING COURSE

Sophomore Year.

	Units.
French or German	3
Graphics, 2, 8	5
Advanced Mechanical Drawing; Descriptive Geom- etry.	
Mathematics, 20, 22 or 21, 22	3
Calculus; Differential Equations.	
Mechanical Engineering, 2, 8	4
Mechanism; Shop-work.	
Physics, 1, 2	5
General Physics; Laboratory Physics	

Junior Year

Applied Mathematics, 20, 21, 22	6
Mechanics; Hydraulics; Mechanics of Materials.	
Electrical Engineering, 1, 2, 3, 4, 5	8
Elementary Electricity; Direct Current Machinery; Electrical Engineering; Electrical Measure- ments; Electrical Engineering Laboratory.	
Mechanical Engineering, 5, 6, 20	6
Metal-work; Engineering Drawing; Steam En- gineering.	

Senior Year.

	Units.
Chemistry, 6	1
Metallurgy.	
Civil Engineering, 5, 6.....	1
Surveying Instruments; Foundations.	
Contracts and Business Law.....	2
Electrical Engineering, 21, 22, 23, 24.....	10
Alternating Currents; Electrical Distribution; Electrical Applications; Electrical Engineering Laboratory.	
Mechanical Engineering, 7, 10, 23.....	5
Machine Design; Engineering Laboratory; Hy- draulic Machinery.	

MECHANICAL ENGINEERING COURSE

Sophomore Year.

	Units.
French or German	3
Graphics, 2, 8	5
Advanced Mechanical Drawing; Descriptive Geom- etry.	
Mathematics, 20, 22 or 21, 22	3
Calculus; Differential Equations.	
Mechanical Engineering, 1, 4	4
Mechanism; Shop-work.	
Physics, 1, 2	5
General Physics; Laboratory Physics.	

Junior Year.

Applied Mathematics, 20, 21, 22	6
Mechanics; Hydraulics; Mechanics of Materials.	
Civil Engineering, 22	2½
Theory of Structures.	
Mechanical Engineering, 5, 6, 9, 20	8
Metal-work; Engineering Drawing; Engineering Laboratory; Steam Engineering.	

Senior Year.

	Units.
Chemistry, 6	1
Metallurgy.	
Civil Engineering, 5, 6	1
Surveying Instruments; Foundations.	
Contracts and Business Law.....	2
Electrical Engineering, 7	3
Dynamos and Motors.	
Mechanical Engineering, 7, 10, 22, 23, 24, 25, 28.....	10
Machine Design; Engineering Laboratory; Internal Combustion Motors; Hydraulic Machinery; Technical Machinery; Compression and Refrig- eration Machinery; Industrial Management.	

PRIZES.

Only candidates for degrees may compete for these prizes.

RUGGLES PRIZES.—The Ruggles Prizes, for excellence in Mathematics, founded by Professor William Ruggles, LL.D., consist of two gold medals, annually awarded upon examination to the best two scholars in Mathematics.

MUNROE PRIZE.—Professor Munroe offers a gold medal to that student from any Washington high school or the Manual Training School who shall attain the highest mark in Chemistry among those passing the entrance examinations, and shall remain in regular attendance for one year.

CLASS OF '96 JAMES MACBRIDE STERRETT, JR., MEMORIAL MEDAL.—This prize is annually awarded to that student taking Course 1 in Physics who obtains the highest average in a special examination on a given subject and in the writing of an essay on an assigned topic.

DAVIS PRIZES.—The Davis Prizes, for excellence in Elocution, founded by the Hon. Isaac Davis, LL.D., of Massachusetts, consist of three gold medals, annually awarded to the successful competitors in a public contest. Members of the Senior Class are eligible to compete for these prizes.

SCHMIDT PRIZES.—Mr. Fred. A. Schmidt offers a prize to the student who attains the highest standing in Descriptive Geometry, Trigonometry, and Analytic Geometry.

MUTH PRIZE.—Geo. F. Muth & Co. offer a set of drawing instruments to the student taking Machine Drawing who makes the highest average record in that subject and in the previous year's Mechanical Drawing.

SCHOLARSHIPS.

Application for scholarships should be filed with the Dean not later than September fifteenth. All scholarships except the Kendall Scholarship and the University Scholarship are awarded for one year only, but they may be renewed. Any student holding a scholarship who fails to obtain a general average of 85 per cent on the work of any term or whose deportment is unsatisfactory will be reported to the President's Council, and in the absence of extenuating circumstances the scholarships will be revoked.

The Kendall Scholarship, the University Scholarships, and the Admiral Powell Scholarships are open to students in the College of Engineering. Detailed statements in regard to these scholarships are given on pages 51-52.

HENRY HARDING CARTER SCHOLARSHIPS.—These scholarships, founded by Mrs. Maria M. Carter in memory of her husband, Henry Harding Carter, consist of four scholarships of the annual value of fifty dollars each, and may be awarded to deserving students who are preparing for the civil engineering profession.

IV. DIVISION OF ARCHITECTURE.

FACULTY.

CHARLES WILLIS NEEDHAM, LL.D.....	PRESIDENT OF THE UNIVERSITY
PERCY ASH, B.S.....	Professor of Architecture in charge of the Division of Architecture
JAMES HOWARD GORE, Ph.D.....	Professor of Mathematics
HOWARD LINCOLN HODKINS, Ph.D.....	Professor of Physics
CHARLES E. MUNROE, Ph.D.....	Professor of Chemistry
HERMANN SCHOENFELD, Ph.D., LL.D.....	Professor of German
CHARLES CLINTON SWISHER, Ph.D., LL.D.....	Professor of History
WILLIAM ALLEN WILBUR, A.M.....	Professor of English
MITCHELL CARROLL, Ph.D.....	Professor of Classical Philology
GEORGE N. HENNING, A.M.....	Professor of Romance Languages
HENRY A. PRESSEY, Ph.D.....	Professor of Civil Engineering
GEORGE LANSING RAYMOND, L.H.D.....	Professor of Æsthetics
ALBERT BURNLEY BIBB.....	Professor of Architecture
EDWIN A. HILL, Ph.D.....	Instructor in Chemistry
F. L. MOLBY.....	Instructor in Freehand Drawing
OTIS D. SWETT, B.S.....	Instructor in Chemistry
DE WITT C. CROISSANT, A.M.....	Instructor in English
OSCAR L. KEITH, A.M.....	Instructor in Romance Languages
PAUL N. PECK, A.M.....	Instructor in Mathematics
ALFRED F. W. SCHMIDT, A.M.....	Instructor in German
EDWIN V. DUNSTAN, B.S.....	Instructor in Civil Engineering
CHARLES MASON REMEY.....	Instructor in Architecture
EDWIN SMITH, JR.....	Assistant in Chemistry
HUBERT P. ILLMAN.....	Assistant in Architecture

ADMISSION.

Each applicant for admission is required to present a testimonial of good moral character, and also a certificate of standing and regular dismissal from the school or college which he has attended or from the tutor with whom he has studied.

Candidates for admission to the Freshman Class may present certificates of admission or take an examination in the required books and subjects.

The general requirement for admission is a four-year high school course, or its equivalent, consisting usually of four or five recitations per week in four or more topics.

Candidates for admission to the course leading to the degree of Bachelor of Science are required to present subjects from the list of high school studies aggregating fifteen units, distributed as follows:

	Units.
English	4
French or German	2
Elementary Algebra	1
Plane Geometry	1
Physics	1
Chemistry	1
Electives	5
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The list of high school studies and the definition of requirements in all preparatory subjects are given on pages 40-50 of this catalogue.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ARCHITECTURE.

To be recommended for the degree of Bachelor of Science in Architecture the student must be registered in the Division of Architecture for at least one academic year, he must satisfy the admission requirements, and must complete the prescribed course for the degree. This is a four-year course. General culture studies are pursued through the first two years, about half of the time being devoted to them. The rest of the course is devoted to architectural work. The unit of credit is one hour of recitation or lecture per week throughout the academic year. Laboratory hours count one-third unit each.

First Year.

	Units.
English	3
Mathematics	3
French, Italian, or German	3
Chemistry	5
Architectural Drawing	3
Shades, Shadows, and Perspectives	2
Freehand Drawing	2
	<hr/> 21

Second Year.

English	3
Mathematics	3
French, Italian, or German	3
Physics	5
Rendering, Design	3
Freehand Drawing	2
History of Architecture	2
	<hr/> 21

Third Year.

	Units.
Mechanics of Material (First term)	3
Graphic Statics (Second term)	
Building Construction	2
Sanitary Engineering of Buildings	1
History of Architecture	2
Pen and Ink Rendering	2
Design and Sketch Design	4
Drawing from the Antique	1
Water Colors	2
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	18

Fourth Year.

Design and Sketch Design—Thesis	5
Modeling (Architectural)	1
Pen and Ink Rendering	1
Classical Archæology	2
History of Painting and Sculpture	2
Building Construction	2
Drawing from Life	1
Water Colors	2
History of Architecture	2
Office practice	1
	<hr/>
	19

A special course of three years may be arranged for qualified students who wish to take the purely technical work of the Architectural course. Special students to receive a certificate on the satisfactory completion of the special course as outlined below.

First Year.

	Units.
Architecture, 3	3
Shades and Shadows, 4	4
Construction, 21	2
Freehand, 2	2
Pen and Ink, 27	1
	<hr/>
	10

Second Year.

	Units.
Architecture, 5	3
Construction, 33	2
History (Mediæval), 32	2
Freehand, 6	2
Water Colors, 34	2
	<hr/>
	11

Third Year.

Architecture, 27	5
History (Renaissance), 23	2
{ History, Painting, and Sculpture, or Archæology,	2
{ History, Classical Architecture	
Office Practice, 36	1
	<hr/>
	10

In addition, before the certificate will be awarded the student must show that he has satisfactorily completed courses 26, 35, and 39.

A fixed fee of \$100 per year to be charged for this work.

PRIZES.

The Washington Architectural Club offers membership in the Club as a prize in Architecture. In 1903-04 this prize was awarded to Charles R. Lombard. In 1904-05 to W. H. I. Fleming. In 1905-06 to S. Peter Wagner.

The Architectural League of America offers an annual Traveling Scholarship in Architecture, value \$1200 to students and draftsmen in Architecture under 35 years of age. All architectural students in the University, who are members of the George Washington University Architectural Club are eligible to compete for this prize.

The following prizes are open to students taking Beaux Arts problems:

PARIS PRIZE.

This prize, conducted by the Society of Beaux Arts Architects, gives to the winner, by authorization of the French Government, the privilege of following the lectures and of taking part in the competition of the first class in Architecture at the Ecole des Beaux Arts of Paris; he must, however, have already successfully pursued studies corresponding to those prescribed in the second class at that institution, for which condi-

tion he will be allowed six months to qualify. The winner, moreover, receives a stipend of two hundred and fifty dollars quarterly during his stay abroad, which should last two and one-half years.

Competitors must be under twenty-seven years of age.

WARREN PRIZE.

This consists of two prizes of fifty dollars and twenty-five dollars respectively for the most successful solution of a problem in planning.

PUPIN PRIZE.

Two prizes of fifty dollars and twenty-five dollars respectively are offered by Prof. PUPIN, of Columbia University, for the best designs for the ornamental treatment of some scientific appliance.

V. COLLEGE OF THE POLITICAL SCIENCES.

FACULTY.

CHARLES WILLIS NEEDHAM, LL.D.	PRESIDENT OF THE UNIVERSITY
C. WILLIAM A. VEDITZ, Ph.D., LL.B.	Acting Dean and Professor of Economics
JAMES HOWARD GORE, Ph.D.	Professor of Mathematics
HOWARD LINCOLN HODGKINS, Ph.D.	Professor of Physics
JOHN M. HARLAN, LL.D.	Professor of American Constitutional Law
DAVID J. BREWER, LL.D.	Professor of International Law
JAMES MACBRIDE STERRETT, D.D.	Professor of Philosophy
CHARLES E. MUNROE, Ph.D.	Professor of Chemistry
HERMANN SCHOENFELD, Ph.D.	Professor of German
CHARLES CLINTON SWISHER, Ph.D., LL.D.	Professor of History
WILLIAM ALLEN WILBUR, A.M.	Professor of English
MITCHELL CARROLL, Ph.D.	Professor of Classical Philology
GEORGE N. HENNING, A.M.	Professor of Romance Languages
OSCAR P. AUSTIN	Professor of Commercial Geography
E. G. LORENZEN, Ph.B., LL.B., J.U.D.	Professor of Commercial Law
WILLISTON S. HOUGH, Ph.M.	Professor of Philosophy
GEORGE P. MERRILL, Ph.D.	Professor of Geology and Mineralogy
PAUL BARTSCH, Ph.D.	Professor of Zoölogy
ALBERT MANN, Ph.D.	Professor of Botany
JAMES BROWN SCOTT, A.M., J.U.D.	Professor of International Law and Diplomacy
JOHN W. HOLCOMBE, M.Dip.	Assistant Professor of Politics
JOHN W. FOSTER, LL.D.	Lecturer on American Diplomacy
JAMES C. MONAGHAN, A.M.	Lecturer on the Consular Service
OTIS D. SWETT, B.S., LL.M.	Secretary

GENERAL STATEMENT.

The College of the Political Sciences will open in the fall of 1907. It is the outcome of what has previously been known as the Department of Politics and Diplomacy, founded in 1898 in close affiliation with the law school of the University. Up to the present time this Department has constituted a graduate and strictly professional branch of the University. Hereafter, however, it will constitute a separate and independent college, offering both undergraduate and graduate courses. The graduate courses, so far as they are of a general character, will be in accordance with the system prevailing throughout the University be in charge of the Faculty of Graduate Studies. So far as they are of a professional character, they will be under the direction of the

Faculty of this College, which will also have complete control over the undergraduate courses of study here offered.

The purpose of the new College is broader than that of the Department of Politics and Diplomacy, although, like the latter, it is also designed to fit men for the public service, particularly for the consular and diplomatic services, and to supply that knowledge of the public life of this country and of foreign countries which will be of most value to journalists, teachers, and other persons aiming to become moulders of public opinion upon the national and international issues of the day. In addition, the new College will offer systematic courses in preparation for higher business careers and for social reform work, and collegiate training of a general cultural character suitable as an introduction to professional training in law.

ADMISSION.

For admission to the College of the Political Sciences the applicant must have had the usual high school training or its equivalent, and he must have received credit for fifteen units of college preparatory work—a unit representing four or five recitations per week for one school year. These fifteen units must include at least four units of English, two units of mathematics, two units of foreign language, and one unit of history, geography or civics. The remaining six units may consist of such other subjects as the student may elect to offer for admission.

GRADUATION AND DEGREES.

Before the student can graduate from this College, he must receive credit for the successful completion, at this University or at other institutions of recognized standing, of sixty units of work of collegiate grade. A unit represents substantially one hour's class-room work throughout a whole academic year. Hence the student taking fifteen hours work per week may complete the course in four years; while by taking more than fifteen hours per week, which can be done only with the express approval of the Dean and under certain conditions, he may shorten by one half-year, or conceivably by a whole year, the period of study requisite for graduation. The degree conferred upon all students for the satisfactory completion of the required amount of undergraduate work is that of Bachelor of Arts.

Two graduate degrees will be conferred for work along lines represented by the College of the Political Sciences—the degree of Master of Arts, and the degree of Master of Diplomacy. The requirements for the Master of Arts degree are precisely similar to those prevailing in the other colleges of the George Washington University, and are determined by the Faculty of Graduate Studies. The degree of Master of Diplomacy, however, is a professional degree,

involving at least one year of graduate study, conferred only upon such students as elect for their major subject international law and diplomacy, and who possess a knowledge of two modern languages of which one must be French.

ARRANGEMENT OF COURSES.

All undergraduate students in this College are required to offer as part of the sixty units requisite for graduation at least three units in English, three units in science or mathematics, three units in modern languages, three units in philosophy, and three units in history or economics. Moreover, at the beginning of his undergraduate work, each student will be required to elect one of several "groups" of studies, designed to fit him especially for the career which he has in mind. For the present, these groups are designated as follows:

The Diplomatic Group.

The Consular Group.

The Law and Administration Group.

The Journalistic Group.

The Finance and Commerce Group.

The History and Economics Group.

Each of these groups contains courses of required study aggregating approximately twenty-five units of work. Thus each student, regardless of the group he elects, must take the fifteen units of absolutely required work, and in addition twenty-five units of work the character of which depends upon the group that he has chosen, leaving a margin of twenty units for the free and unrestricted selection of such studies as the student may care to pursue. It is provided, however, that in the choice of these free electives the student shall not be allowed to scatter his energies by undertaking too great a variety of courses, or, on the other hand, to attempt too narrow a specialization.

Students who have carried on collegiate work in other universities or colleges of recognized standing, and who have received credit from such institutions for the successful completion of work there carried on, will be admitted to advanced standing in the College of the Political Sciences in accordance with the amount of work already accomplished. No student, however, can receive a degree for work in the College of the Political Sciences at this University for less than one year's residence in this College, no matter how much work he may have accomplished successfully elsewhere.

Graduates from other colleges and universities of recognized rank may be admitted to graduate courses in this College and become candidates for graduate degrees at this University, provided they furnish

evidence that the nature of their undergraduate work has been such as to fit them for the successful pursuit of the graduate studies which they intend to carry on.

Inasmuch as several additions are about to be made to the Faculty of the College of the Political Sciences and the plan of studies has not been completely elaborated, the University will soon publish a separate statement regarding the work and organization of this College. This statement will be mailed upon application to all persons addressing the Registrar of the University. Inquiries for specific information may be addressed to the Acting Dean of this College.

VI. DIVISION OF EDUCATION.

FACULTY.

CHARLES WILLIS NEEDHAM, LL.D.	PRESIDENT OF THE UNIVERSITY
WILLISTON S. HOUGH, Ph.M.	Professor of Philosophy in Charge of the Division of Education
JAMES HOWARD GORE, Ph.D.	Professor of Mathematics
HOWARD LINCOLN HODGKINS, Ph.D.	Professor of Physics
JAMES MACBRIDE STERRETT, A.M., D.D.	Professor of Philosophy
CHARLES E. MUNROE, Ph.D.	Professor of Chemistry
HERMANN SCHOENFELD, Ph.D., LL.D.	Professor of German
CHARLES CLINTON SWISHER, Ph.D., LL.D.	Professor of History
WILLIAM ALLEN WILBUR, A.M.	Professor of English
MITCHELL CARROLL, Ph.D.	Professor of Classical Philology
GEORGE N. HENNING, A.M.	Professor of Romance Languages
PERCY ASH, C.E.	Professor of Architecture
C. WILLIAM A. VEDITZ, Ph.D., LL.B.	Professor of Economics
GEORGE P. MERRILL, Ph.D.	Professor of Geology and Mineralogy
PAUL BARTSCH, Ph.D.	Professor of Zoölogy
GEORGE LANSING RAYMOND, L.H.D.	Professor of Æsthetics
ALBERT MANN, Ph.D.	Professor of Botany
*	Instructor in Education
ELMER ELLSWORTH BROWN, Ph.D.	Lecturer
WILLIAM ESTABROOK CHANCELLOR, Ph.D.	Lecturer
GEORGE E. MYERS, Ph.D.	Lecturer
WILLARD S. SMALL, Ph.D.	Lecturer
WILLIAM W. BLACK, A.M.	Lecturer
STEPHEN ELLIOTT KRAMER, B.S.	Lecturer
OTIS D. SWETT, B.S.	Secretary

ADMISSION.

Applicants for admission as regular students must comply with the entrance requirements either for the Bachelor of Arts or for the Bachelor of Science Course in Columbian College (see pp. 37 and 38). But persons desirous of taking one or more of the professional courses, without becoming candidates for a degree, may be admitted as special students on the presentation of satisfactory evidence that they are qualified to pursue the work to advantage. Students already matriculated in Columbian College may be admitted to the Teachers' Course, but not later than the beginning of their Junior year, unless by vote of the Faculty they be admitted at a subsequent period.

* To be appointed.

THE TEACHERS COURSE.

The Teachers Course is designed to provide instruction in pedagogical science, and also professional training for the vocation of teaching and of school administration.

To be recommended for a Bachelor's degree in Arts or Science and a Teacher's Diploma, the student must complete courses of study aggregating at least sixty units. Thirty of these units are prescribed studies and thirty are electives. The prescribed studies are the following: (A) Either, in addition to the prescribed studies for the Bachelor of Arts Course, three units in Science and three units in History; or, in addition to the prescribed studies for the Bachelor of Science Course, three units in History and three units in Philosophy; (B) nine units in Education (see "Education" under University Subjects, p. 91). Electives should be chosen with direct reference to the subjects which the student wishes to teach.

THE TEACHER'S DIPLOMA.

The Teacher's Diploma is granted in connection with either the Bachelor of Arts or the Bachelor of Science degree, upon the fulfillment of the following conditions: (a) the student must have satisfactorily completed the courses of study defined in the preceding paragraph; (b) he must, in the judgment of his instructors, also possess other qualifications essential to success in teaching.

The Diploma is also given in connection with higher degrees, provided a graduate student has taken a major or minor in Education, and has also satisfied the requirements *a* and *b* above, or, in lieu of *a*, has completed an equivalent amount of pedagogical work in another institution.

TEACHERS APPOINTMENT BUREAU.

The Division of Education maintains a Teachers Appointment Bureau for the purpose of aiding students who are studying, or have studied, in the Teachers Course, or in Columbian College, to secure positions as teachers. This service is performed gratuitously, in the interest both of students and of superintendents of schools and boards of education wishing to employ teachers. Communications should be addressed to the "Teachers Appointment Bureau," The George Washington University.

Department of Arts and Sciences.

COURSES OF INSTRUCTION.

UNIVERSITY SUBJECTS.

University Subjects are divided into three sections, in accordance with the following requirement of an ordinance adopted by the Board of Trustees, October 12, 1902:

ARTICLE IV.—*Development of University Subjects.*

SECTION 1. Subjects shall be divided into three sections, as follows:

(1) The fundamental section, covering two years' work; this section to be assigned to students in the general-culture courses.

(2) The advanced section, not exceeding three years; this section to be assigned to students specializing for literary, scientific, professional, or industrial pursuits.

(3) The original research section; this section to be assigned to students pursuing a subject for discovery and broader culture.

The courses in the first section may sometimes be recommended to graduate students, but are not ordinarily counted toward the higher degrees. The courses in the second section are in general for advanced students, candidates for the Bachelor's degree; they serve, however, with additional work as minors for the higher degrees, provided they have not already counted toward a degree. They may be taken by students in the second year of their course only by special permission of the professor in charge. The courses in the third section are in general for graduate students only, candidates for one or other of the higher degrees. They are open to undergraduates only on the recommendation of the instructors, and no undergraduate student shall take in one year more than one course in the third section. When an announced course has not been applied for by at least three students, candidates for a degree, the instructor may withdraw the course. First-section courses are numbered 1 to 19, inclusive; second-section courses from 20 to 39, inclusive; third-section courses are numbered on from 40. The number of hours, unless otherwise specified, indicates hours per week throughout the year. The unit of credit is one hour of recitation or lecture work per week for one academic year; laboratory hours in Chemistry and Architecture count one-third unit each, in other subjects one-half unit each. Sixty units of credit is the minimum requirement for the Bachelor's degree. Laboratories and drawing rooms will be open from

9.30 a. m. till 10 p. m., with competent assistants in charge to direct students. No student is admitted to a course unless he fulfills all of the preliminary requirements for that course, or otherwise satisfies the instructor that he is prepared to pursue it. Every student must make his election of courses so as to avoid conflict between the hours appointed for recitations.

ANATOMY.

D. KERFOOT SHUTE, A.B., M.D.....*Professor*

Third Section. Primarily for Graduates.

40. ANATOMY OF THE NERVOUS SYSTEM.—This course includes laboratory work, readings, and recitations. The nervous system is investigated in typical animals of the different classes, especially with the view of gaining some insight into the phylogeny of the central nervous system in man. The growth of the brain and its physical characters as related to intelligence are investigated. The histology and embryology of the central nervous system and the sense organs are studied. A history of the guiding conceptions in neurology is to be acquired. The course is designed to inculcate students of anatomy, medicine, and psychology with a sound knowledge of the architecture and functions of the nervous system of man. Two hours. Professor SHUTE.

APPLIED MATHEMATICS.

EDWIN V. DUNSTAN, C.E.....*Instructor*

OSCAR A. MECHLIN, C.E.....*Instructor*

Second Section. For Undergraduates and Graduates.

20. Analytical and Applied Mechanics. (1) Statics: including the composition, resolution, and equilibrium of forces; center of gravity; friction; machines. (2) Kinematics and Kinetics: including rectilinear and curvilinear motion; motion under action of variable forces and in resisting media; constrained and rotatory motion; impact; work and energy; moment of inertia. Four hours a week during the first term.

21. Hydraulics. The theoretical principles of hydraulics, including hydrostatics, flow through orifices, over weirs, through pipes and in open channels, and the dynamic pressure of water. Experiments in connection with this course are made in the Engineering Laboratory. Four hours a week during the second term.

22. Mechanics of Materials and Theory of Elasticity, including elastic and ultimate strength and deformation; simple, cantilever and continuous beams; columns, torsion; combined stresses; compound columns and beams, including reinforced concrete; resilience; work; fatigue; mathematical theory of elasticity. Four hours a week during the second term.

ARCHÆOLOGY, CLASSICAL.

MITCHELL CARROLL, Ph.D. Professor
 CHARLES B. NEWCOMER, Ph.D. Instructor

Second Section. For Undergraduates and Graduates.

The following cycle of courses in Classical Archaeology is given, extending over a period of three years. Each course consists of weekly lectures and conferences illustrated by maps, plans, photographs, and lantern slides, supplemented by a prescribed course of reading and the preparation of papers on special topics. The work constitutes a two-hour elective, or either the lectures on Mondays or the class conferences on Thursdays may be taken as a one-hour elective. A knowledge of Greek or Latin is not essential.

20. Topography and Monuments of (a) Athens and (b) Rome. A study of the history, topography, and monuments of the chief centers of ancient life. Given in 1906-07. *Mon., Th.*, at 4-50. Professor CARROLL, Dr. NEWCOMER.

21. Life of the Greeks and Romans. Selected topics in Private and Public Life. Given in 1905-06. *Mon., Th.*, at 4-50.

22. Greek and Roman Architecture and Sculpture. Given in 1907-08. Professor CARROLL.

In all these courses considerable use is made of the illustrative material accessible in the Library of Congress, the Corcoran Gallery of Art, and the Smithsonian Institution.

ARCHITECTURE.

PERCY ASH, B.S. Professor in charge
 ALBERT BURNLEY BIBB. Professor
 CHAS. MASON REMEV. Instructor
 FRANK L. MOLBY. Instructor in Freehand Drawing
 HUBERT P. ILLMAN. Assistant

Criticisms in design are regularly given by practicing architects, in addition to the regular corps of instructors.

Instruction in drawing from the antique and from life is given at the Corcoran Gallery of Art by Mr. Brooke, Miss Mueden, and Mr. Messer.

First Section. Primarily for Undergraduates.

1. Freehand Drawing. This course consists of drawing, in charcoal, of cubes, cones, etc. *Mon., Sat.*, at 5-40. Mr. MOLBY.

2. Freehand Drawing. For architectural students primarily. This course begins with drawing, in charcoal, of cubes, cones, etc., and is followed by a series of drawings from architectural casts. *Mon., Sat.*, at 4-50. Mr. MOLBY.

3. Architectural Drawing and Elementary Design. This course includes the study of the Five Orders of Architecture, the use of India ink, and water-color rendering. Lectures on the Five Orders on Tuesday, at 4.50 and instruction in the use of color and rendering in India ink on Thursday, at 4.50, and at least ten additional hours in the drafting-room. Professor ASH.

4. Shades, Shadows, and Perspectives. A course in orthographic projections, shades, shadows, and perspectives. *Wed., Fri.*, at 4.50. Mr. REMEY.

5. Rendering and Design. In this course the instructions in India ink rendering and the use of water colors given in the first year are continued. At least twelve hours each week are devoted to the problems in design. Six regular problems and five sketch problems constitute the course in design. Criticism, by Professor ASH and Mr. REMEY.

6. Freehand Drawing. The drawing from architectural casts in both charcoal and pencil continues the work begun in the first year, and is intended to fit the student for his subsequent freehand drawing from the antique. *Mon., Sat.*, at 4.50, and at least two additional hours. Mr. MOLBY.

7. History of Art. A course in the history of sculpture, architecture, and painting. Open only to women. *Mon., Wed., Fri.*, at 2.30. Miss ELLIS.

Second Section. For Graduates and Undergraduates.

20. History of Architecture. History of Classical and Early Christian architecture. Illustrated. Two lectures per week. *Tues., Thurs.*, at 4.50. Professor BIBB.

21. Building Construction. Frame construction and interior finish. *Wed., Fri.*, at 5.40. Professor ASH.

22. Sanitary Engineering of Buildings. One hour.

23. History of Architecture. History of Renaissance architecture. Illustrated. Two lectures per week, and one additional hour for research. *Mon., Fri.*, at 4.50. Professor ASH.

24. Pen and Ink Rendering. A study of the works of the best draftsmen, with practice in the use of the pen as a means of architectural expression. Two hours. Professor ASH.

25. Design and Sketch Design. This course embraces problems in plan, in archæology, and in sketch design. Three problems in archæology, three plan problems, and five sketch problems constitute the course. The student is required to spend at least sixteen hours in the drafting-room each week. Criticism, by Professor ASH and Mr. REMEY.

26. Drawing from the Antique. To be eligible for this course the student must have passed satisfactorily Course 6. He is required to devote at least four hours per week to working from the antique in the Corcoran Gallery of Art.

27. Design and Sketch Design. Thesis. Problems of an advanced character are assigned to the student during the first term. Three advanced problems and three sketch problems are required of the student in addition to his thesis. The three months preceding graduation are devoted to the production of the thesis designs, the subject for the thesis being selected by the student. The student is required to spend twenty hours each week in the drafting-rooms. Criticism is given three times a week by Professor ASH and Mr. REMY.

28. Modeling (Architectural). This course will be arranged and an instructor appointed at an early date.

29. Pen-and-ink Rendering, being a continuation of the work begun in the third year. The work consists largely of the making of pen-and-ink drawings from photographs of architectural subjects. Two hours per week are devoted to this work.

30. Classical Archaeology. *Mon.*, and *Thurs.*, at 4.50. Professor CARROLL. (See Section on Archaeology.)

31. History of Painting and Sculpture. This course will comprise a series of illustrated lectures on painting and sculpture. The details of the course will be given later.

32. History of Mediæval Architecture. Two lectures and one hour for research per week. Professor BIER.

33. Building Construction. Masonry, cements, foundations, soils, etc. *Mon.*, at 5.40, *Wed.*, at 4.50. Professor ASH.

34. Water Colors. Two hours per week. Professor BIER.

35. Drawing from Life. Six hours per week at the Corcoran Gallery of Art.

36. Office Practice. A course of practical planning and detailing. Four hours per week. Professor ASH.

37. A special course in design will be given, consisting of six regular and five sketch problems. This course is intended to prepare students for the Beaux Arts problems. Criticisms, by Professor ASH and Mr. REMY.

38. In this course the problems prepared by the New York Society of Beaux Arts Architects will be offered to the students, and the judgments will be made by the jury in New York City under the rules of the society. Criticisms, by Professor ASH and Mr. REMY.

39. Summer Work. Each architectural student is required during the summer vacation to make at least twenty-four sketches from nature, or

to do an equivalent amount of work, namely, four weeks in an architect's office, or the measured drawings of an existing monument of architecture.

Third Section. Primarily for Graduates.

40. Composition as applied to architecture.

41. Advanced design.

Offer: A special course in Architecture, extending through three years, for which a certificate will be issued.

ASTRONOMY.

EDGAR FRISBY, A.M.....	Professor
HERBERT LOUIS RICE, M.S.....	Professor
ASAPH HALL, JR., Ph.D.....	Professor

Third Section. Primarily for Graduates.

40. The Theory of Computing the Orbits of Comets. Encke's Memoir on Olbers' Method, Abhandlungen, Erster Band. Gauss' Theoria Motus. Books of reference: Watson's Astronomy, Oppolzer's Bahnbestimmung der Cometen und Planeten. Professor FRISBY.

41. The Theory of General Perturbations. Tisserand, Mécanique Céleste. Books of reference: Laplace, Mécanique Céleste; Lagrange, Mécanique Analytique, and Memoirs; Leverrier, Annals of the Paris Observatory; Hansen, Auseinandersetzung; Pontécoulant, Système du Monde, etc. Professor FRISBY.

42. On the Theory and Practice of Interpolation. A special course, including a full discussion of the properties of differences, the various formulæ and methods of interpolation, tabular differentiation, and mechanical quadrature; also other important problems concerned, with the tabular values of functions, for those desiring special acquaintance with this fundamental and important subject. Professor RICE.

43. Celestial Mechanics. Theory of central forces; theory of parabolic and elliptic orbits. Lectures with reading from the works of Gauss, Oppolzer and Moulton. Professor HALL.

ASTRO-PHYSICS.

FRANK HAGAR BIGELOW, A.M., L.H.D.....	Professor
FREDERICK E. FOWLE, JR.....	Lecturer

Third Section. Primarily for Graduates.

40. Solar Physics. The constitution of the sun, the sun-spots, faculæ, prominences, and the coronas; the circulation of the solar mass and the distribution of these phenomena in latitude and longitude, their

variations in the 3-year, 11-year, and 35-year periods; the grounds for the theory that the sun is a magnetized body, associated with electric currents and an ionized radiation. **Professor BIGELOW.**

41. **Cosmical Electricity and Magnetism.** The two fields of force emanating from the sun, their modes of propagation through the ether as electromagnetic and magnetic types of energy, and their relation to the heat and light received by the earth; the laws of radiation and the determination of the solar constant; the variations in the solar spectrum due to changes in the physical states of the sun's and the earth's atmospheres. Authors: Maxwell, Poincaré, J. J. Thompson, Hertz, Heaviside, Webster, with references to the recent literature in scientific journals. **Professor BIGELOW.**

42. **Terrestrial Magnetism.** The distribution and secular variation of the magnetism of the earth, its periodic and irregular disturbances by solar action; magnetic observatories, instruments, and methods of observing; atmospheric electricity and ionization; terrestrial radioactivity and emanations; auroras, magnetic storms, and their relation to the gases of the atmosphere, with a history of the progress of science in these lines of research; the work of the Mount Weather Meteorological Research Observatory in connection with solar physics. Authors: Gauss, Mascart, Stewart, and Gee; numerous reports of observatories and recent scientific papers. **Professor BIGELOW.**

43. **Meteorology.** The theories of the general motions of the earth's atmosphere and of the generation of local cyclones and anti-cyclones, periodic variations in the pressure, temperature and precipitation of the atmosphere due to solar operations; short and long range predictions of the weather for the United States.

The results of the International Cloud Survey of 1896-1897; of the Weather Bureau nephoscope observatories in the West Indies, 1898-1902; a comparative study of the theories of dynamic meteorology; Bigelow's standard system of equations useful in meteorology; the gradients of pressure, temperature, and vapor tension as determined by cloud observations, balloon and kite ascensions; the barometry and thermometry of the United States; eclipse meteorology and allied problems; the new cosmical meteorology; these and related topics are included in this course. **Professor BIGELOW.**

44. A lecture course on the astro-physical instruments employed in modern research; the siderostat, the coelostat, the heliometer, the spectroheliograph, spectroscopes and telescopes generally, explaining their mechanical parts, the methods of obtaining the instrumental errors, and the formulæ for reducing the observations. To be taken in connection with Courses 40 and 41. **Mr. FOWLE.**

BACTERIOLOGY AND PATHOLOGY.JAMES CARROLL, M.D.....*Professor**Third Section. Primarily for Graduates.*

40. Bacteriology. Special studies and practical research work. Professor CARROLL.

BOTANY.ALBERT MANN, A.M., Ph.D.....*Professor**First Section. Primarily for Undergraduates.*

1. General Plant Morphology and systematic relationships between higher and lower forms as to structure and organs. First half year.

General Plant Physiology, especially of the higher plants. Second half year. Lectures, Tu., at 4.50. Laboratory work, Th., 4.50 to 6.30.

2. Biological Botany; Ecology, the relation of plants to each other and to their environment; Geographical Botany and the distribution of plants. First half year.

Paleontological Botany; Comparative Morphology of Plants in relation to origin and to the classification of existing plants. Second half year. Lectures, Tu., at 5.40. Laboratory work, Sat., 4.50 to 6.30.

Second Section. For Undergraduates and Graduates.

20. Comparative Biology. This course consists of lectures and classroom demonstrations treating of the different functions and phenomena of life as they are exhibited in both animals and plants. The lectures are given by the Professor of Zoology and the Professor of Botany alternately. Wed., at 4.50. Professors BARTSCH and MANN.

21. Plant Histology; studies in general cell structure and in Comparative Embryology. First half year.

Higher Plant Physiology; modifications in structure by natural and artificial means; cultivated plants. Second half year. Lecture, one hour. Laboratory, two hours.

Third Section. Primarily for Graduates.

40. Original investigations in (a) Economic Botany, Materia Medica, etc.; (b) Parasitism and Monstrosities; (c) Researches in Physiology of single groups; (d) Comparative Organography.

CHEMISTRY.CHARLES E. MUNROE, Ph.D.....*Professor*
FRANK WIGGLESWORTH CLARKE, Sc.D. *Professor of Mineral Chemistry*
HARVEY W. WILEY, Ph.D., M.D....*Professor of Agricultural Chemistry*
EDWARD G. SEIBERT, M.D.....*Assistant Professor*

N. MONROE HOPKINS, Ph.D.	Assistant Professor
EDWIN A. HILL, Ph.D.	Assistant Professor
THOMAS M. PRICE, Ph.D.	Assistant Professor
OTIS D. SWETT, B.S.	Instructor
ELMER S. NEWTON, B.A., M.D.	Instructor
WALTER O. SNELLING, M.S.	Instructor
WILLIAM E. HILLYER, M.S.	Assistant
EDWIN SMITH, JR., B.S.	Assistant in Assaying
ALBERT P. CLARK, Pharm.D.	Assistant
JOHN P. FREY	Assistant
ROBSON DE S. BROWN	Assistant

First Section. Primarily for Undergraduates.

1. General Chemistry. A series of illustrated lectures, accompanied by recitations and exercises, on theoretical, inorganic, organic, and technical chemistry. *Tu., Th., Sat.*, at 4.50. Professor MUNROE, Mr. SWETT.
2. Laboratory Practice. A laboratory course for the study of the principles of chemistry and the methods of conducting chemical experiments. Two three-hour periods. *Tu., Th.*, at 1.30. Professor MUNROE, Dr. HILL, Mr. SNELLING, Mr. HILLYER, Mr. BROWN.
3. Preparation and Study of the Properties of Chemical Substances. A laboratory course. Two three-hour periods. *Tu., Th.*, at 1.30. Professor MUNROE, Dr. PRICE, Mr. SNELLING, Mr. HILLYER, Mr. BROWN.
4. Assaying and Metallurgy of the Precious Metals, carried on by the methods used by the Government assayers, the laboratory being fitted up on the plan of that of the United States Mint. Twelve hours, for three months. Professor MUNROE, Mr. SMITH.
5. Lectures on the Principles of Analysis. One hour. Professor MUNROE.
6. Metallurgy of Iron and Steel. A course of lectures and readings. *Tu.*, at 5.40. Professor MUNROE.
7. Qualitative Analysis. A brief course intended primarily for students in engineering. Two three-hour periods. Professor MUNROE, Dr. PRICE, Mr. SNELLING, Mr. SMITH.

Second Section. For Undergraduates and Graduates.

20. Qualitative Analysis. A laboratory course in the study of the properties and reactions of chemical substances, and of the means employed for their detection and identification. Three three-hour periods. Professor MUNROE, Dr. PRICE, Mr. SNELLING, Mr. SMITH.
21. Quantitative Analysis. A laboratory course in the quantitative estimation of the constituents of a specially selected and typical set of chemical substances, which are particularly adapted for teaching the

student the aims and methods of quantitative chemical analysis and for imparting facility in manipulation. Four three-hour periods. Professor MUNROE, Dr. PRICE.

22. Technical Analysis and Industrial Processes. A lecture and laboratory course in which the elements of chemical engineering are taught, and special attention is given to rapid commercial methods of analysis. Four three-hour periods. Professor MUNROE.

23. Advanced course in Organic Chemistry. *Wed., Fri.*, at 4.50. Professor MUNROE, Mr. SWETT.

24. Advanced course in Organic Chemistry. A continuation of Course 23. *Th., Sat.*, at 5.40. Professor MUNROE, Mr. SWETT.

25. Chemistry of the Carbon Compounds. A laboratory course in the preparation and study of the properties of a characteristic series of organic compounds. Four three-hour periods. Professor MUNROE, Dr. PRICE, Mr. SWETT.

27. Stereo-chemistry. This course deals with the arrangements of atoms in space from a theoretical standpoint, while the student is taught how to form models by which to illustrate their arrangements. Two hours. Assistant Professor HILL.

28. Biochemistry. A laboratory course in the chemical examination of some of the chief foodstuffs, the tissues and fluids of the body, and the products of certain organisms; also the isolation of the digestive enzymes and a study of their action *in vitro*. Three three-hour periods. Assistant Professor PRICE.

29. Organic Chemistry. Especially designed for students in medicine and dentistry. Two hours for one term. Professor MUNROE.

30. Physiological Chemistry. A series of lectures and recitations on the proximate principles of the human body. Two hours for one term. Assistant Professor SEIBERT.

31. Clinical Analysis. A laboratory course to accompany 29. Professor MUNROE, Assistant Professor SEIBERT, Dr. CLARK, and Mr. FREY.

34. Volumetric Analysis. Especially designed for students in medicine. Professor MUNROE and Dr. NEWTON.

Third Section. Primarily for Graduates.

40. Explosive Substances. Professor MUNROE.

41. Analytical Methods. Professor MUNROE.

42. The Phenomena of Deliquescence and Efflorescence. Professor MUNROE.

43. Development of the Theory of the Constitution of the Natural Silicates. Professor CLARKE.

44. Special Researches in Agricultural Chemistry. Professor WILEY.

45. Special Researches in Electro-chemistry. Assistant Professor HOPKINS.

Students in Chemistry are invited to attend the meetings of the Chemical Society of Washington. These meetings are held on the second Thursday of each month from October to May, in the Assembly Hall of the Cosmos Club, at 8 p. m.

CIVIL ENGINEERING.

HENRY A. PRESSEY, Ph.D.....	Professor
EDWIN V. DUNSTAN, C.E.....	Instructor
OSCAR A. MECHLIN, C.E.....	Instructor

First Section. Primarily for Undergraduates.

1. Surveying and Mapping. This course includes the theory and use of instruments; land, topographic, hydrographic, mining, city, and geodetic surveying; measurement of volumes, projection of maps, etc. Text-book, Johnson's Surveying. Two hours a week. Field work, not less than 60 hours during the session, usually on Saturday morning.
2. Railroad Engineering. Railroad curves and earthwork; location of about two miles of railroad, including reconnaissance, preliminary and final locations, construction of contour maps and profiles, computation of earthwork, design of culverts, etc.; laying out curves; track work, etc. Two hours a week. Field work not less than 60 hours during the session.
3. Highways and Pavements. Location of highways; construction, improvement and maintenance of roads and pavements; curbs, gutters, sidewalks. One lecture and one design period during the first term.
4. Materials of Construction. A study of the properties of stone, brick, cement, concrete, wood, iron, steel, etc., with reference to processes of manufacture. The course is supplemented by a number of practical tests made by the students. Two lectures for first term and one lecture and one laboratory period for second term.
5. Surveying Instruments. A two months' course for Mechanical and Electrical Engineering students, covering the use of the compass, transit, and level. Lectures and field exercises, two hours per week.
6. Foundations. A two months' course for Mechanical and Electrical Engineering students, covering the general principles of foundation construction and the materials used. Two hours a week.
7. Engineering Laboratory. Experimental work in connection with Applied Mathematics, 21, 22; Civil Engineering, 22, 24, and Mechanical Engineering, 23. One laboratory period per week for the second term.

Second Section. For Undergraduates and Graduates.

20. **Masonry Construction.** A course in the use of cement, brick, stone, and concrete, the design of foundations, retaining walls, dams, bridge piers and arches. Included in this is a short course in stereotomy. Two lectures and two design periods per week.

21. **Hydraulic Engineering.** The design and construction of water power plants and irrigation works. Flow of rivers; rainfall and runoff; methods of development; hydraulic motors; power transmission. Irrigation plans; distributing systems; water rights and irrigation law. Two lectures and one design period per week.

22. **Theory of Structures.** A course covering the determination of stresses in framed structures by graphical and by analytical methods. The first term is devoted to beams and roof trusses; the second to bridge trusses under uniform and wheel loads. Three lectures and two design periods per week.

23. **Theory of Structures.** The theory of steel design; the design of a roof truss, of a plate girder and a pin connected bridge truss and a study of the theory and design of suspension, continuous, cantilever, and arch bridges, and the details of steel mill and office buildings construction. Three lectures and two design periods per week.

24. **Sanitary Engineering.** This course treats of the drainage of buildings and lands, the treatment and disposal of sewage and the sewerage of cities and towns; public water supply and methods of water purification. Three lectures and one design period per week.

Third Section. Primarily for Graduates.

40. **Advanced Masonry.** A course in the theory and design of reinforced concrete structures.

41. **Advanced Masonry.** The theory of retaining walls and arches.

42. **Testing of Materials.** This course involves original research upon assigned topics.

43. **Water Power Development.** A comparative study of the principal water power developments of the United States and Europe. The course consists largely of assigned readings and reports thereon.

CLASSICAL LANGUAGES AND LITERATURES.

MITCHELL CARROLL, Ph.D.....	Professor
CHARLES SIDNEY SMITH, Ph.D.....	Assistant Professor
CHARLES B. NEWCOMER, Ph.D.....	Instructor

GREEK.

First Section. Primarily for Undergraduates.

1. Lysias (selected orations); Herodotus (selections); Euripides (Alcestis); Greek prose composition. *Mon., Wed., Fri.*, at 2.30. Assistant Professor SMITH.

2. Thucydides (Book VII); Sophocles (Antigone); Xenophon (Memorabilia). *Mon.*, at 11.30; *Wed.*, at 11; *Fri.*, at 11.30. Professor CARROLL and Dr. NEWCOMER.

3. Elementary Course. For students who have not taken Greek before matriculating. It aims to cover as much as possible of the entrance requirements in Greek. With private study during the summer the student may be able to take up Course 1 at the beginning of the following year with condition on Homer. Three hours. Assistant Professor SMITH.

Second Section. For Undergraduates and Graduates.

20. Plato (selections); Aristophanes (Clouds); Aeschylus (Prometheus). *Tu., Th.*, at 9.30. Given in 1906-07. Not given in 1907-08. Professor CARROLL and Dr. NEWCOMER.

21. Greek Literary Criticism: Aristotle (Art of Poetry); Aristophanes (Frogs); Greek Lyric Poetry (selections); Conferences on History of Greek Literature. *Tu., Th.*, at 9.30. Given in 1907-08. Professor CARROLL.

22. Greek Prose Composition (advanced course): Practical exercises in syntax and translation. *Th.*, at 11.30. Professor CARROLL.

23. Homer: Rapid reading of the Odyssey. One hour. *Fri.*, at 4.50. Assistant Professor SMITH.

24. Lucian (selections). For rapid reading. *Th.*, at 3.30. Given in 1906-07. Not given in 1907-08. Dr. NEWCOMER.

LATIN.

First Section. Primarily for Undergraduates.

1. Livy (Books I, XXI); Cicero (De Senectute); Horace (Odes and Epodes); Latin prose composition. *Mon., Wed., Fri.*, at 1.30. Assistant Professor SMITH.

2. Cicero and Pliny (selected letters); Satires and Epistles of Horace; Ovid (selections); Martial (selections). *Mon., Wed., Fri.*, at 3.30. Professor CARROLL and Assistant Professor SMITH.

Second Section. For Undergraduates and Graduates.

20. Tacitus (selections); Vergil (Bucolics); Lucretius. *Tu., Th.*, at 10.30. Given in 1906-07. Not given in 1907-08. Professor CARROLL and Dr. NEWCOMER.

21. Roman Literary Criticism: Quintilian (Book X) and Horace (*Ars Poetica*); Catullus, Tibullus, and Propertius; Conferences on History of Roman Literature. *Tu., Th.*, at 10.30. Not given in 1906-07. Given in 1907-08.

22. Latin Composition and Reading at Sight: Practice in Latin expression and style. *Tu.*, at 1.30. Assistant Professor SMITH.

23. Plautus and Terence. *Th.*, at 1.30. Assistant Professor SMITH.

24. Cicero's Orations. A course for advanced students who expect to be teachers. Given in 1906-07. Not given in 1907-08. Two hours. Professor CARROLL and Dr. NEWCOMER.

25. Cæsar's Gallic and Civil Wars. A course for advanced students who expect to be teachers. Given in 1907-08. Professor CARROLL.

NOTE.—Students in Greek and Latin are recommended to take as electives the following courses in Classical Archæology:

20. Topography and Monuments of (a) Athens and (b) Rome. *Mon., Th.*, at 4.50. Given in 1906-07. Not given in 1907-08. Professor CARROLL and Dr. NEWCOMER.

21. Private and Public Life of the Greeks and Romans. Given in 1905-06. *Mon., Th.*, at 4.50.

22. Greek and Roman Architecture and Sculpture. Not given in 1906-07. Given in 1907-08. Professor CARROLL.

Third Section. Primarily for Graduates.

THE SEMINARY OF CLASSICAL PHILOLOGY.

Professor CARROLL *Director*

The design of the Seminary of Classical Philology is to afford discipline in the methods of philological criticism and research with especial reference to the interpretation of classical authors. It is composed of all graduate students in Classical Languages, and is under the supervision of the Director, who is assisted by the other instructors of the department in certain features of the work. The authors selected for criticism and interpretation are as follows:

1906-07. Greek, 43, Attic Orators; Latin, 43, Cicero.

1907-08. Greek, 40, Aristophanes; Latin, 40, Plautus.

1909-10. Greek, 41, Thucydides; Latin, 41, Tacitus.

1910-11. Greek, 52, Homer; Latin, 42, Vergil.

Regular meetings of the Seminary are held on *Tu., Wed.*, at 4.50.

SCHOOL OF CLASSICAL STUDIES AT ATHENS.—The University, through friends, is a contributor to the support of the American School of Classical Studies at Athens, and graduates of this University are entitled to all its advantages without expense for tuition.

THE CLASSICAL CLUB.

The Classical Club, which is composed of instructors and advanced students in Greek and Latin and Classical Archaeology, meets monthly for the more detailed discussion of special topics in ancient life, literature, and art than is ordinarily possible in the class-room. Teachers and patrons of the classics in Washington are admitted as associate members, and at open meetings the club avails itself, when possible, of the services of eminent scholars from other universities who may be temporarily in the city.

Students in classical languages and members of the Classical Club are invited to attend the public lectures of the Washington Society of the Archaeological Institute of America, which are held usually in University Hall.

For notice of the Wachsmuth Classical Library see page 23.

ECONOMICS AND SOCIOLOGY.

C. WILLIAM A. VEDITZ, Ph.D., LL.B. *Professor of Economics*
OSCAR P. AUSTIN. *Professor of Commercial Geography*

ECONOMICS.

First Section. Primarily for Undergraduates.

1. **Elementary Economics.** Introduction to the study of political economy, beginning with a brief sketch of the rise and development of the science and an outline of the industrial evolution of the United States. Although this is essentially a course in economic theory, the student is led to observe the phenomena of every-day industrial life. The text-books used as a basis for the course are supplemented by lectures, assigned reading from the classical economists and typical modern authorities, class-room discussions, and reports on assigned topics by members of the class. First half-year, *Mon. Wed., and Fri.*, at 3.30. Professor VEDITZ.

2. **The Economics of Distribution and Consumption.** A continuation of Course 1. This course, however, places emphasis upon the problems that center around the division of the social product,—the problems of rent, interest, wages and profit. It includes also an examination of Competition, Private Property, and *Laissez faire*, from the standpoint of public welfare; and of certain problems that belong partly to the field of social ethics,—Luxury, Saving, Spending, and Speculation. Second half-year, *Mon., Wed., and Fri.*, at 3.30. Professor VEDITZ.

Second Section. For Undergraduates and Graduates.

20. **Industrial Evolution.** A general survey of the development of society from an economic point of view, and more particularly to dis-

cover the forces which have given rise to modern capitalism and large-scale methods of production. Half of the course is devoted to the study of present industrial conditions in the United States, particularly the trust movement. First half-year, *Mon., Wed.*, at 4.50. Professor VEDITZ.

21. *Socialism and Social Reform.* The course begins with a history of communistic schemes, particularly so-called "Utopian" socialism as advocated by Plato, Thomas More, Saint Simon, Fourier, and Owen. This is followed by an examination of modern collectivism of the single-tax doctrine of Henry George, of schemes of profit-sharing between employer and employees, and of co-operation. In alternate years; not given in 1906-07. Second half-year, *Mon., Wed.*, at 4.50. Professor VEDITZ.

22. *Labor Laws.* A study of the principal problems arising from modern conditions of production, and of the growth, nature and policies of labor organizations,—child labor, workmen's insurance, employers' liability, strikes, collective bargaining, etc. In alternate years; given in 1906-07. Second half-year, *Mon., Wed.*, at 4.50. Professor VEDITZ.

23. *Commercial Geography.* Given in the College of the Political Sciences. Two hours. Professor AUSTIN.

SOCIOLOGY.

Second Section. For Undergraduates and Graduates.

20. *The Science of Society.* A general course in theoretical sociology. The scope of sociology; its relation to the individual social sciences; the organic concept of society; the contract theory and its variants; the fundamental factors of social evolution; the biological, economic, and psychological schools of sociologists; race, environment, and heredity; forms of society; social institutions in their origin and development; social progress. *Tu., Th.*, first half-year, at 4.50. Professor VEDITZ.

21. *American Social Problems.* A course in practical sociology designed to acquaint the student with the great social problems in this country—immigration, pauperism, unemployment, charity organization and poor relief, slums, intemperance, and criminality. This course is not technical, but intended as a preparation for intelligent citizenship. Students are encouraged to undertake sociological field-work and to study the charitable and correctional institutions and practices of the District of Columbia. Class visits are made to institutions of this character, and from time to time specialists in social reform work are invited to lecture to the class. *Tu., Th.*, second half-year, at 4.50. Professor VEDITZ.

Third Section. Primarily for Graduates.

40. Criminology and Penology. An advanced course in social philosophy for the consideration of the following subjects: The concept of crime; the necessity of legal compulsion; evolution of the idea of crime; the *lex talionis*; the nature and purposes of punishment; social defense; the individualization of punishment; capital punishment; duels and ordeals; reformation; the indeterminate sentence; the French *loi Bérenger*; juvenile courts; prison systems; etc. Professor VEDITZ.

41. Seminary in Economics and Sociology. A limited number of students competent to undertake advanced work are organized into a Seminary for the investigation of problems in Economics and Sociology. Two hours. Professor VEDITZ.

EDUCATION.

WILLISTON S. HOUGH, Ph.M.	Professor
ELMER ELLSWORTH BROWN, Ph.D.	Instructor
WILLIAM ESTABROOK CHANCELLOR, Ph.D.	Lecturer
GEORGE E. MYERS, Ph.D.	Lecturer
WILLARD S. SMALL, Ph.D.	Lecturer
WILLIAM W. BLACK, A.B.	Lecturer
STEPHEN ELLIOTT KRAMER, B.S.	Lecturer

Course 1, or Course 2, must precede, or be taken parallel with, all courses in Education. Candidates for a degree in the Teachers Course must complete courses 1 or 2, 20, 21, or 22, 23, 24, 25, 28, and electives amounting to at least one unit in Education, and are recommended to take courses 24 and 25, or their equivalent, in Philosophy. Those desirous of specializing in School Administration are advised to take also courses 1 and 2 in Economics and 20 and 21 in Sociology.

First Section. Primarily for Undergraduates.

1. Educational Psychology. The psychological principles underlying educational theory. Specially designed for students taking the Teachers Course. Text-book with lectures. *Tu.* and *Th.*, at 10.30. First half-year.

2. The Psychology of the Teaching Process. The course includes the science and art of the recitation and of school management in general. Designed for teachers and for students in the Teachers Course. *Mon.* and *Wed.*, at 4.50. First half-year. Mr. BLACK.

Candidates for a degree in the Teachers Course must take Philosophy "1," either before, or in conjunction with, courses 1 or 2 in Education.

* To be appointed.

Second Section. For Undergraduates and Graduates

20. **Educational Doctrine Past and Present.** The contributions of Plato, Aristotle, Bacon, Comenius, Locke, Rousseau, Pestalozzi, Froebel, Spencer, Hall, Dewey and others. Attention will be given to the relations between the educational thought and the great social and political movements of the same period. Monroe's "History of Education," with lectures. *Sat.*, 10 to 12. Throughout the year. (Two hours credit.) Dr. MYERS.

21. **Child Study,** with special reference to the problems of teaching. The subject includes adolescence and abnormal tendencies. Kirkpatrick's "Fundamentals of Child Study," with lectures, assigned reading, and experiments. *Tu.* and *Fri.*, at 4.50. Throughout the year. Dr. SMALL.

22. **Principles of Teaching.** A systematic and comprehensive course in pedagogical science. *Mon.* and *Wed.*, at 10.30. Throughout the year.

23. **General Methods.** The logical and psychological factors as determining the processes of learning and teaching. *Mon.* and *Wed.*, at 4.50. Second half-year. Mr. BLACK.

24. **School Management.** The purpose of this course is to discuss, chiefly with reference to higher elementary and secondary school teaching, the principles and practices of school, class and pupil instruction and discipline in both public and private schools. The methods and devices employed in successful schools, both regular and special, will be presented in detail. The course is designed both for principals, supervisors, and other teachers of experience, and for systematic teachers of education. Fifteen lectures. *Th.* at 4.50. First half-year. Superintendent CHANCELLOR.

25. **School Legislation, Organization, and Administration.** This course will present the social, economic, political, and cultural principles, both historically and philosophically, that have lead to modern American practices in respect to public, private, and endowed educational institutions and systems. In the light of these principles, the methods and prescriptions of both the theory and the practice of public school administration will be presented. This course is designed for the superintendents, directors, principals, and systematic students of education. Fifteen lectures. *Th.* at 4.50. Second half-year. Superintendent CHANCELLOR.

26. **Educational Theory.** The list of topics in this course includes five lectures upon the theoretical bearing of certain questions relating to Educational practice. The later lectures of the course will consider the four great modern theories of education, the culture epochs or recapitulation theory, the sociological theory, the historical or opportunity theory, and the psychological theory. There will also be a

discussion of comparative national theories. Fifteen lectures. First half-year. First five lectures, Commissioner BROWN. Ten lectures, Superintendent CHANCELLOR.

28. Practice Course. Observation classes and teaching in practice schools. To count as two hours a week for half a year. Either half year.

29. The Method of the Recitation and Practical Problems of Class Management. *Tu. and Th.*, at 5-40. Second half-year. Mr. KRAMER.

30. Manual Training in Education. Historical survey. The justification of manual training from the biological view-point; from the sociological and economic view-points. Its fundamental aims. Present tendencies and dangers. Special problems. One hour. First half-year. Dr. MYERS.

31. Moral Aspects of Education. The place of the school in moral training, in relation to the home, the church, and the general social environment. The physiological basis of character. Development of the moral nature in the child. Individual differences. The teacher's personality. The various means afforded by every school for moral training. Direct versus indirect means. Special methods of moral training,—Abbotsholme, Ethical Culture school, Elmira Reformatory, etc. Harmonizing the moral forces of the school. One hour per week. Second half-year. Dr. MYERS.

32. School Sanitation and Hygiene. This course will present such data and principles of hygiene and sanitation as are necessary for intelligent teaching. Special attention will be given to diseases and defects incident to school life, to instruction as related to fatigue, and to particular subjects and practices. Lectures, demonstrations, and reference work. One hour a week. First half-year. Dr. SMALL.

33. Education as a Factor in Public Health. This course will consider the function of education in promoting public health; the present status of health control in public education; and the administration problems involved. Seminar open only to advanced students. One hour a week. Second half-year. Dr. SMALL.

34. Method in Teaching Grammar and Composition. Designed for both elementary and secondary instruction. One hour a week. First half-year. Mr. BLACK.

35. Method in Teaching Reading and Literature. (In sequence to Course 34.) One hour. Second half-year. Mr. BLACK.

36. Nature Study. Seminary Course. Individual problems worked out with reference to the principles and methods of nature study. One hour a week. First half-year. Mr. BLACK.

37. Educational Ends and Values. Lectures on the Philosophy of Education. One hour a week. Second half-year. Professor HOUGH.

(Courses 30 to 37 inclusive will not be given in 1907-08, but may be expected in 1908-09.)

Third Section. Primarily for Graduates.

40. Educational Psychology. Special problems in the psychological basis of educational theory will be arranged for graduates taking a major or minor in Education. Professor HOUGH.

ELECTRICAL ENGINEERING.

FRANK A. WOLFF, Ph.D.....	Professor
PHILANDER BETTS, M.S., E.E.....	Assistant Professor
A. PRESS, B.S.....	Lecturer
EVERETT W. VARNEY, A.B.....	Instructor

First Section. Primarily for Undergraduates.

1. Elementary Mathematical Theory of Electricity and Magnetism, with special attention to the needs of engineering students. Three hours a week, until January 1.
2. Direct-current motors and generators. Covers the laws of the magnetic circuit as applied to the dynamo. Students are required to design a direct-current machine. Text-books: Hawkins and Wallis's "The Dynamo." Three hours a week, beginning January 1st.
3. Elements of Electrical Engineering. Text-book: Tyson Sewell's "Elements of Electrical Engineering." Two hours a week.
4. Electrical Measurements. A laboratory course for Juniors. Selected experiments. Foster's hand-book and special laboratory notes are used for reference. Six hours a week, first term.
5. Electrical Laboratory. Experiments and tests involving the operation of direct-current dynamos and motors, including tests of motors in service, operating elevators, street cars, and machinery of various kinds. Textbook: Sever and Townsend's "Laboratory and Factory Tests in Electrical Engineering." Six hours a week, second term.
6. Industrial Electricity. A practical course intended for Juniors in Civil Engineering, embracing the selection and operation of electrical machinery, electric railways and other applications of electric motors. Two hours a week for the first term.
7. Electrical Engineering. A course in theoretical and applied electricity intended for Seniors in Mechanical Engineering. It embraces the selection and operation of electrical machinery, the location, construction, and operation of power plants, electric railways and transmission lines, the use of electric motors for driving machinery, and the working of storage batteries, elevators, hoists, and cranes. Three hours a week.

Second Section. For Undergraduates and Graduates.

21. Alternating Current Theory and Machinery. A course for Seniors in Electrical Engineering, covering the principles of single as well as polyphase currents, including study of machines, circuits, transformers, etc. Four hours a week, Senior year.

22. Electrical Distribution. A course for Seniors in Electrical Engineering covering the whole field of distribution of electricity for light and power. Text-book: Crocker's "Electric Lighting"; second volume, "Distribution Systems." Two hours a week.

23. Electrical Applications. A course for Seniors in Electrical Engineering, covering the more important applications of electricity, such as illumination, motive power, signalling, telephony, electro-chemistry, etc. Two hours a week.

24. Advanced Laboratory Work for Seniors in the Electrical Engineering Course. Covers test and experimental work with direct and alternating currents, tests of machines, circuits, transformers, circuits containing inductance and capacity, measurement of power in alternating current circuits, plotting of curves, etc. Text-book: Sever and Townsend's "Laboratory and Factory Tests in Electrical Engineering," with Foster's Electrical Engineer's Hand-book for general reference. Six hours a week.

25. Inspection of Plants and Industrial Works. In the vicinity of Washington and Baltimore are a number of modern electric lighting and street railway plants, telephone exchanges, telegraph operating rooms, Government laboratories devoted to special work, etc., which afford students of Electrical Engineering an opportunity to familiarize themselves with nearly all types of apparatus in use. The visits are followed by class discussion based on written descriptions submitted by the students.

Juniors and Seniors in Electrical Engineering are required to attend the monthly meetings of the Washington Branch of the American Institute of Electrical Engineers held at the University.

Third Section. Primarily for Graduates.

41. Advanced Dynamo Design. This comprises the more rigid calculation of the magnetic circuit, the estimation of the electrical and mechanical losses, together with an exposition of the elements of mechanical design. For the direct current dynamo the theory of commutation will be dealt with in detail. In alternating current working, as well as direct, the theory of armature reaction will be thoroughly gone into. For the induction motor the Ossana circle diagram will be exclusively used. The calculation of the magnetic dispersion coefficients and the self-induction and apparent resistance of conductors due to

high frequency phenomena will be made an important part of the course. An elementary knowledge of the differential and integral calculus will be necessary as the advanced work will require an elucidation of the theory of potential.

42. Advanced Course in the Mathematical Theory of Alternating Currents.

43. Advanced Course in Polyphase Currents.

44. Advanced Laboratory Work, Alternating (including Polyphase) Current Apparatus.

ENGLISH.

WILLIAM ALLEN WILBUR, A.M.	Professor
DE WITT C. CROISSANT, A.B.	Assistant Professor
HARRIETT STRATTON ELLIS, A.B.	Instructor

First Section. Primarily for Undergraduates.

1. Rhetoric. The principles of self-expression in three phases, in the science of rhetoric, in English literature, and in composition. *Tu., Sat., at 10.30.* Professor WILBUR.

2. Rhetoric. Parallel with Course 1. *Mon., Fri., at 4.50.* Professor WILBUR.

NOTE.—The required Freshman English consists of Courses 1 and 9, or 2 and 10.)

3. Prose. The development of prose from Sir John Mandeville to Robert Louis Stevenson. About twenty representative prose works are studied in chronological order. The aim of the course is to study critically the development of prose in regard to its form. The course is open to students who have passed in Freshman English. *Mon., at 9.30; Wed., at 9; Fri., at 9.30.* Assistant Professor CROISSANT.

5. American Literature. Lectures on the development of the literature. Students taking this course are required to do wide reading, which is discussed by the class. *Mon., Fri., at 5.40.* Assistant Professor CROISSANT.

6. English Literature. An historical development, with the design of giving a general view and emphasizing the art motive together with the various foreign influences that enter into the formation of the literature. Open only to women. *Tu., Th., at 3.30.* Miss ELLIS.

7. English Literature. Parallel with Course 6. Open only to men. *Tu., Th., at 9.30.* Assistant Professor CROISSANT.

9 a. Logic. Text-book, with lectures. First half year.

b. Psychology. Text-book, with lectures. Part 1. Second half year.

This course is to be taken in conjunction with Course 1. *Th.*, at 10.30.
Professor HOUGH.

10. a. Logic. First half year.

b. Psychology. Second half year.

Parallel with Course 9. To be taken in conjunction with Course 2.
Wed., at 4.50. **Professor HOUGH.**

Second Section. For Undergraduates and Graduates.

20. Composition. An advanced course open to students who have passed in Freshman English. *Tu.*, at 1.30. **Professor WILBUR.**

22. Shakespeare. The Comedies. Given in 1906-07. Not given in 1907-08. **Professor WILBUR.**

23. Shakespeare. Tragedies and Romances. Given in 1907-08. *Mon., Wed., Fri.*, at 1.30. **Professor WILBUR.**

The Temple edition of Shakespeare is recommended.

26. English Romanticism. The history of the Romantic movement in England with studies in the literature. The course may be taken only in conjunction with French 26. Given in 1907-08. *Tu., Th.*, at 11.30. **Professor WILBUR.**

27. The English Novel. Development of the Novel, with critical studies of selected works, including some contemporary fiction. Given in 1906-07. Not given in 1907-08. **Professor WILBUR.**

28. Old English. A beginners' course; the essentials of the grammar and readings from Old English texts. Bright's Reader. [Advanced work may be arranged for competent students.] *Tu., Th.*, at 2.30. **Assistant Professor CROISSANT.**

30. Middle English. In the first term particular attention is given the grammar; in the second term more attention is given the literature, with wider reading and special reports. Emerson, A Middle English Reader. [Advanced work may be arranged for competent students.] *Mon., Fri.*, at 2.30. **Assistant Professor CROISSANT.**

34. History of English Literature to 1700. Given in 1906-07. Not given in 1907-08.

35. History of English Literature since 1700. Not given in 1906-07. Given in 1907-08.

Courses 34 and 35 are given in alternate years, and together form a complete history of English Literature. Lectures are given on the development of the literature, and the class is required to read as widely in the literature itself as the time allows. Open to students who have passed in English 6 or 7 or an equivalent course. *Mon., Fri.*, at 10.30. **Assistant Professor CROISSANT.**

Third Section. Primarily for Graduates.

40. History of the English Language. Development of the sounds and inflections with some reference to the other Germanic dialects. A reading knowledge of German and previous study of Old and Middle English are prerequisite. Assistant Professor CROISSANT.

44. Seminary in English Literature. Subject in 1906-07: British Poetry of the Nineteenth Century. Subject in 1907-08: Paradise Lost. Two hours. Professor WILBUR.

53. English Romanticism, with particular reference to the beginnings of the romantic movement in the eighteenth century.

55. Religious Philosophy in the Poetry of Tennyson.

Other courses may be arranged for competent graduates.

GEOLOGY AND MINERALOGY.

GEORGE P. MERRILL, Ph.D. Professor
TIMOTHY W. STANTON, Ph.D. Assistant Professor
R. S. BASSLER, Ph.D. Assistant Professor

First Section. Primarily for Undergraduates.

1. Mineralogy. Crystallographic, descriptive, and determinative mineralogy. This course is designed with especial reference to minerals as rock constituents or segregated as ore deposits. It includes, therefore, a discussion of not merely the crystallographic and theoretical, but the practical side of the subjects as well. Whenever possible, it should be considered as introductory to the courses in either systematic or economic geology. *Tu., Th., at 5.40.*

2. Geology. Systematic geology; dynamical, structural, and stratigraphical. The course is designed to form a part of a general-culture course, or a preliminary course for those intending to make a specialty of geology. It includes lectures, recitations, laboratory and field work so far as hours will permit. Paleontology is treated as a branch of geology, having especial reference to stratigraphy and correlation. Text-books: Scott's Introduction to Geology; Merrill's Rocks, Rock Weathering and Soils. *Mon., Fri., at 5.40.*

Second Section. For Undergraduates and Graduates.

20. Economic Geology. The course consists largely of lectures upon the subjects comprised under: (1) Mineral veins and metalliferous deposits, their mode of occurrence, origin, and classification; (2) the ores of iron, copper, lead, zinc, tin, silver, gold, mercury, antimony, etc.; and (3) the non-metallic minerals, as the coals and hydrocarbon compounds; salts and materials used in chemical manufactures; abrasive, refractory, and fictile materials, pigments, gems, ornamental stones,

building stones, limes, cements, and mineral waters. Text-books: Ries' *Economic Geology of the United States*; Merrill's *Stones for Building and Decoration*, and the *Nonmetallic Minerals*. *Mon., Fri.*, at 4.50.

21. *Paleontology*. A course in lecture and laboratory work on the biological and geological relations of the more important types of animals and plants, with especial reference to their value in stratigraphic geology. Two hours.

Third Section. Primarily for Graduates.

Advanced study in Geology, both systematic and applied, is arranged to cover two years.

40. *Advanced Geology and Paleontology*. The student in this first-year course may devote his time largely, if necessary, to perfecting himself in methods; to general work in the laboratory and in the field; to the examination of geological materials, and to familiarizing himself with the literature of the subject. The utility of the various text-books is recognized, but a very large portion of the desired knowledge on any subject must be gained from special memoirs and from the current literature as it appears in numerous periodicals. The various sources of information, the most essential lines of work, as well as the most promising fields of investigation, are from time to time indicated by the instructor.

41. *Advanced Paleontology and Stratigraphic Geology*. A continuation of Course 21. Besides the study of paleontological methods, the student is expected to pursue some special line of investigation in order to fit himself for original research.

GERMANIC LANGUAGES AND LITERATURES.

HERMANN SCHOLNFELD, Ph.D., LL.D. *Professor*
A. F. W. SCHMIDT, A.M. *Assistant Professor*

First Section. Primarily for Undergraduates.

1. A preliminary course in grammar, narrative prose, the elements of historical reading, and select poems of the principal modern poets. Special stress is laid on exercises in composition. One classic (Schiller) is studied. The work done is equivalent to a two years' course in high schools or academies of good standing. Open to students who have not presented German for admission. *Tu., Th., Sat.*, 9.30. Assistant Professor SCHMIDT.

2. Parallel with Course 1, but planned primarily for students in the sciences. *Tu., Th., Sat.*, at 4.50. Assistant Professor SCHMIDT.

3. The deeper aspects of grammar; accurate training in phonetics and translation into German; conversation; readings from the best

German prosaists and poets; selected texts from Schiller, Lessing, Goethe, Freytag, and the foremost recent authors. Beginnings of German literature and history. Open to students who have passed Course 1 or 2, or have fulfilled the entrance requirement in Elementary German. *Mon.*, at 11.30; *Wed.*, 11; *Fri.*, at 11.30. Professor SCHOENFELD.

4. Parallel with Course 3, but planned primarily for students in the sciences. *Tu., Th., Sat.*, at 5.40. Assistant Professor SCHMIDT.

5. Advanced course in German syntax; principal difficulties of the language; idioms; synonyms; extensive translations of the best English prosaists into German; essays; selected advanced prose; classical reading and literature; German history. Special training for advanced students in the historical and economic departments. Open to students who have passed Course 3 or have fulfilled the entrance requirements in Advanced German. *Mon., Wed., Fri.*, at 1.30. Professor SCHOENFELD.

6. Parallel with Course 5, but planned primarily for advanced students in the sciences.

Second Section. For Undergraduates and Graduates.

20. German Literature in the first half of the nineteenth century; its social and political aspects; special study of Kleist, Uhland, Heine; the Romantic School; classicism till Goethe's death; essays, lectures, and collateral reading. *Tu., Th.*, at 10.30. Professor SCHOENFELD.

21. German Literature of the Classic Period at its zenith; Goethe's and Winckelmann's influence on German art; Modern German drama; Hebbel, Ludwig, Freytag, Heyse, Sudermann, Fulda, Hauptmann. *Mon.*, at 10.30; *Wed.*, at 10; *Fri.*, at 10.30. Professor SCHOENFELD.

The intervening periods of Modern German Literature will be studied during the subsequent academic year.

Third Section. Primarily for Graduates.

40. German Literature in the sixteenth century. Braune's *Neudrucke Deutscher Literaturwerke*. Humanism and Reformation, with special reference to Italian and French influences and their historical basis. Original readings from the Humanists, Hans Sacks, Fischart, and Luther's works. The reformatory projects of Cardinal Nicolaus Cusanus and of Erasmus, Hutten, and Reuchlin. Professor SCHOENFELD.

41. German Literature in the twelfth and thirteenth centuries, with special regard to the *Nibelungen lay*, the *Gudrun saga*. Wolfram von Eschenbach. The lyrics of Walther von der Vogelweide. The grammatical aspects of the classics of the first period of bloom. Professor SCHOENFELD.

The other phases of older German literature and philology will be studied in subsequent years, so that the general range of the history of German Literature may be covered every three years.

45. The emerging of the Germanic, Romance, and Slavic races in European History. The Migration of Peoples. The Evolution of European States to the rise of the Hapsburg House. Cultural elements influencing the three predominating races of Europe. (Selections from the historical sources are read and interpreted.) Professor SCHOENFELD.

46. The Annihilation and Reconstruction of Prussia (Historical and literary sources will be searched). The Building up of the Modern German Empire (Archival studies, literary, social forces, Bismarck's literary work.) Professor SCHOENFELD.

47. Gothic. Gothic Grammar and translation of select passages from Wulfila. Braune's Gotische Grammatik. Assistant Professor SCHMIDT.

The aim of this course and the one following is to give the student an insight not only into the development of the German language, but also into the principles of Germanic philology.

48. Old High German. Old High German Grammar and translation of select passages in prose and verse. This course alternates with the one in Gothic. Not given in 1907-08. Given in 1908-09. Assistant Professor SCHMIDT.

For notice of the Richard Heinzel Germanic library, see page 120.

GRAPHICS.

EDWIN V. DUNSTAN, C.E.Instructor
ARTHUR CUTTS WILLARD, B.S.Instructor

First Section. Primarily for Undergraduates.

1. Mechanical and Freehand Drawing. A general course embracing the care and use of instruments; orthographic and isometric projections; sections and intersections; curve plotting; sketching of simple machine details; freehand lettering; principles of working drawings. Six hours a week in the drawing-room.

2. Advanced Mechanical Drawing. A course in working drawings especially designed for Electrical and Mechanical Engineering students. Drawing-room rules and practice; conventional forms and standards; arrangement of views and sections; freehand shop-sketches; detailing from sketches, models and general drawings; proportioning by empirical formulae. Every effort is made to develop distinctness in delineation, accuracy in dimensions and professional style and finish in each drawing. Six hours a week in the drawing-room.

8. Descriptive Geometry. A study of the representation of lines, surfaces, and solids, and of their relations; tangencies, intersections, and developments; warped surfaces; shades and shadows; original construction problems. Two lectures and one drawing period per week.

10. Topographic Drawing. A general course to accompany the work in surveying. One drawing period per week.

Second Section. For Undergraduates and Graduates.

20. Graphic Statics. Principles and methods, including the construction and use of the force and equilibrium polygons; dead, live, snow, and wind loads; the graphic analysis of beams, girders, roof, and bridge trusses. Two lectures and one design period per week.

Third Section. Primarily for Graduates.

40. Advanced Graphic Statics. A study of the graphical analysis of higher structures, with special reference to the method of influence lines.

GREEK.

(See statement under Classical Languages and Literatures.)

HISTORY.

CHARLES CLINTON SWISHER, Ph.D., LL.D.....	Professor
*L. RUSSELL ALDEN, A.M.....	Instructor
JAMES FREDERICK PEAKE, A.M.....	Instructor
† —————	Instructor
WILLIAM HAMILTON, Ph.D.....	Lecturer

First Section. Primarily for Undergraduates.

1. Mediæval History. Beginning with a comprehensive survey of those conditions of ancient civilization which have been most potent in their influence upon later times, this course treats in detail the migration and settlement of the Germanic tribes in the territory of the Empire, and the gradual blending of Roman and Teutonic institutions into the modern state. Text books, lectures, and collateral reading. *Mon., Wed., Fri., at 2.30. Mr. PEAKE.*

2. Modern European History. A history of the European states, under the new conditions brought into existence by the Protestant Revolution, the invention of printing, and the discovery of America, to the period of the French Revolution. Text-books, lectures, and reports. *Tu., Th., Sat., at 11.30. Mr. PEAKE.*

* Absent on leave.

† To be appointed.

3. English Constitutional History. A history of the evolution of parliamentary government, with incidental study of social and industrial development. *Mon., Wed.*, at 4.50. Professor SWISHER and Mr. PEAKE.

Second Section. For Undergraduates and Graduates.

20. Ancient History. A history of the Eastern Nations and Greece to the period of the Roman Conquest. Text-books and collateral reading. *Mon., Fri.*, at 10.30. Omitted 1907-08. Mr. ———.

21. Roman History. The political history of Rome from the establishment of the republic to the reign of Constantine the Great. Text-books and collateral reading. *Mon., Fri.*, at 10.30. Mr. ———.

22. European History During the Revolutionary Period. The political significance of the Revolution of 1789, the career of Napoleon, and the subsequent progress toward constitutional government on the continent of Europe through the revolutionary movement of 1848. Lectures, text-books, and examinations, with the assignment of special subjects for investigation and report. *Tu., Th.*, at 4.50. Professor SWISHER and Dr. HAMILTON.

23. Contemporaneous History. The realization of the movements toward national unity in Germany and Italy, with a discussion of the resulting conditions in their relation to international politics. Lectures and examinations, with the assignment of special subjects for investigation and report. Open to students who have completed courses 1, 2, and 22. *Wed., Fri.*, at 2.30. Professor SWISHER and Dr. HAMILTON.

24. European Diplomatic History. A general history of the international relations of the European states from the treaties of Westphalia, with special discussion of some of the more recent treaties. Lectures, examinations, and collateral reading. Open to students who have completed courses 22 and 23. *Wed., Fri.*, at 5.40. Professor SWISHER and Mr. PEAKE.

25. American Colonial History. A study of the economic, political, and social conditions of the English colonies which led to the Revolution of 1776, and the movement toward national union. Lectures, text-books, and collateral reading. *Mon., Fri.*, at 4.50. Professor SWISHER.

26. American Constitutional History. The origin and development of the Federal Constitution of 1789, with a comprehensive study of its interpretation under the pressure of party issues extending through the periods of division and reunion. Lectures, text-books, and collateral reading. *Mon., Fri.*, at 4.50. Professor SWISHER.

27. American Industrial History. An economic interpretation of some of the more distinctive phases of American politics. Open to students who have completed courses 25 and 26. Two hours. *Tu., Th.*, at 4.50. Professor SWISHER.

28. Party Government in the United States. A study of the issues upon which parties are founded, with an examination into party methods as illustrated in political platforms, primaries, nominating conventions, and campaign literature. Open to students who have taken courses 25 and 26. Two hours. *Wed., Fri., at 1.30.* Professor SWISHER.

29. The Spanish Colonies in America. A study of the Spanish colonial policy as illustrated in the growth and subsequent independence of Mexico and the South American states. Lectures and examinations. Two hours. *Mon., at 0.30; Wed., at 9.00.* Professor SWISHER.

30. Current History. A discussion of political questions of the present time with special reference to their origin and historical significance. One hour. Lectures and examinations. *Wed., at 11.00.* Professor SWISHER.

Third Section. Primarily for Graduates.

40. A discussion of the sciences auxiliary to historical study, of historical materials, and of the methods employed in the investigation, presentation, and general treatment of historical evidence. The course is intended primarily as an object lesson in the principles of historical criticism, for the assistance of graduate students in the preparation of theses. Professor SWISHER.

41. American Constitutional History, 1776 to 1789. A history of the origin and formation of the Federal Constitution. Professor SWISHER.

42. The Slave System in American Politics. A study of parties and party issues from the period of the Missouri Compromise to the formation of the Republican Party. Professor SWISHER.

43. American History from 1860 to 1883. A constitutional study of the period of Civil War and Reconstruction. Professor SWISHER.

44. English Constitutional History from 1603 to 1689. A study of the constitutional issues between Crown and Parliament under the Stuarts through the Revolution of 1689. Professor SWISHER and Mr. PEAKE.

45. English History from 1783 to 1885. A history of the reform movement in England from the close of the American Revolution through the second ministry of Gladstone. Professor SWISHER and Mr. PEAKE.

46. The History of France from 1789 to 1804. Constitutional development in France from the meeting of the States General to the beginning of the First Empire. Dr. HAMILTON.

Work in seminars. The results of individual research upon assigned topics, and reviews of recent political and historical publications by graduate students will be discussed at the weekly meetings of the seminars of history.

HYDRAULIC ENGINEERING.

HENRY L. ABBOTT, LL.D. *Professor*

Third Section. Primarily for Graduates.

40. Laws of flowing water, in natural channels, in pipes, and over weirs, with modes of measurement.
41. Underground flow as sources of supply, with modes of estimation.
42. Relation to rainfall run-off.
43. Regulation of river flow for purposes of navigation, and for protection against inundation.
44. Slack-water navigation, including dams, canal locks, and waste weirs.
45. Earth dams and river embankments, theory and modes of construction.
45. Effect of forests upon water supply.

ITALIAN.

(See statement under Romance Languages and Literatures.)

LATIN.

(See statement under Classical Languages and Literatures.)

MATHEMATICS.

JAMES HOWARD GORE, Ph.D. *Professor*
 PAUL NOBLE PECK, A.M. *Assistant Professor*
 GEORGE ALBERT ROSS, A.M. *Instructor*

First Section. Primarily for Undergraduates.

2. Plane and Solid Geometry: Gore's Plane and Solid Geometry; Tu., Th., at 5.40. Assistant Professor PECK.
3. Solid Geometry: Gore's Plane and Solid Geometry. Mon., at 9.30; Wed., at 9; Fri., at 9.30, October and November. Assistant Professor PECK.
4. Algebra: Bowser's College Algebra. Mon., Wed., at 4.50. Assistant Professor PECK.
5. Algebra: Bowser's College Algebra. Mon., at 9.30; Wed., at 9; Fri., at 9.30, December to March. Assistant Professor PECK.
6. Solid Geometry: Gore's Plane and Solid Geometry. Tu., Th., Sat., at 4.50, October and November. Assistant Professor PECK.
7. Plane Trigonometry: Gore's Plane and Spherical Trigonometry. Mon., at 9.30; Wed., at 9; Fri., at 9.30, April and May. Assistant Professor PECK.

8. Algebra: Bowser's College Algebra. *Tu., Th., Sat.*, at 4.50, December to March. Assistant Professor PECK.

9. Trigonometry: Gore's Plane and Spherical Trigonometry. *Mon.*, at 11.30; *Wed.*, at 11; *Fri.*, at 11.30, October to December. Professor GORE.

10. Plane Trigonometry. Gore's Plane and Spherical Trigonometry. *Tu., Th., Sat.*, at 4.50, April and May. Assistant Professor PECK.

11. Analytic Geometry: Smith and Gale's Analytic Geometry. *Mon.*, at 11.30; *Wed.*, at 11; *Fri.*, at 11.30, January to May. Professor GORE.

12. Trigonometry: Gore's Plane and Spherical Trigonometry. *Mon., Wed., Fri.*, at 5.40, October to December. Assistant Professor PECK and Mr. Ross.

14. Analytic Geometry: Plane and Solid; Smith and Gale's Analytic Geometry. *Mon., Wed., Fri.*, at 5.40, January to May. Assistant Professor PECK and Mr. Ross.

NOTE.—Courses 2 and 4 are intended for students who desire to review some parts of elementary algebra and plane geometry, in order to obtain that thorough and ready knowledge of these fundamental mathematical studies that is necessary for their proper use in other subjects. These classes are not intended for beginners, and only students who have studied elementary algebra and plane geometry are admitted.

Courses 3, 5, and 7 are designed to occupy one year; likewise Courses 2 and 4.

Second Section. For Undergraduates and Graduates.

20. Differential and Integral Calculus: Taylor. *Mon., Wed., Fri.*, at 4.50, for six months. Professor GORE and Mr. Ross.

21. Differential and Integral Calculus: Taylor. *Mon.*, at 9.30; *Wed.*, at 9; *Fri.*, at 9.30, for six months. Professor GORE and Mr. Ross.

22. Differential Equations: Osborne. *Mon., Wed., Fri.*, at 4.50, April and May. Professor GORE and Mr. Ross.

23. Differential Equations: Osborne. *Mon.*, at 9.30; *Wed.*, at 9; *Fri.*, at 9.30. Professor GORE and Mr. Ross.

In all the above courses the text is supplemented by lectures and the principles emphasized by proposing for solution a large number of problems taken from the best European and American authorities.

While the disciplinary value of the study of mathematics is never lost sight of, the importance of its practical application is insisted upon.

Third Section. Primarily for Graduates.

41. Theory of the Complex Variable. Lectures with reference to Durege and Forsyth. Professor GORE.

43. Differential Equations. Cohen's Differential Equations. Professor GORE.

45. Elliptic Functions. Lectures with reference to Cayley, Tannery and Molk, and Koenigsberger. Not given in 1907-08.

MECHANICAL ENGINEERING.

..... *Professor*
EDWARD ADAMS MUIR, B.S. *Assistant Professor of Graphics*
PHILANDER BETTS, E.E. *Assistant Professor of Electrical Engineering*
ARTHUR CUTTS WILLARD, B.S. *Instructor*

First Section. Primarily for Undergraduates.

1. Mechanism. A course in the systematic study of the kinematics of machinery, in which mechanical movements are reduced to scientific analysis. Carefully developed problems and diagrams of changes of position and speed in mechanisms are constantly used.

Some attention is given to the design of gear teeth, and valve gears for steam engines, and the necessary theory for such design is carefully studied. Wherever possible the application of the principles of mechanism to modern American machine tools is discussed. Two lecture-recitation hours and two drawing hours per week during the Sophomore year.

4. Woodwork. This course is intended to provide the student with a knowledge of the principles involved, rather than manual dexterity in such work, which can only be secured by prolonged practice.

The work includes: (1) Exercises in planing, sawing, mortising, joining, framing, and other work involving the common carpenters tools; (2) exercises involving the use of power machinery, circular saws, planer, scroll saw, lathe, etc.; (3) exercises in pattern making, including patterns and core-boxes for various machine parts; (4) study of moulding, casting, and foundry operation. Four hours per week in the shops during the Sophomore year.

5. Metal Work. This course is intended to illustrate, by practical work, the methods and principles underlying the best modern practice.

The work includes: (1) Exercises in forging, heating, bending, welding, annealing, hardening, tempering, etc., including toolmaking; (2) exercises in vise-work, including chipping, filing, scraping, polishing, etc.; (3) exercises in machine work in metals, including turning, planing, boring, grinding, etc. Six laboratory hours per week during the Junior year. Electrical Engineering students are given a modified course of three hours per week.

6. Engineering Drawing. This course provides for the application of the principles taught in the courses of Mechanism and Steam Engineering to specific problems. Practice is given in the design of valve gears and quick return motions, and in the determination of velocity diagrams for special engine and other linkages.

There is also included the complete working drawings for a steam boiler, with the idea of not only teaching the method of drawing boilers, but also to give more familiarity with the construction and details of steam boilers. This latter work is preparatory to the course in Machine Design. Six drawing hours per week during the Junior year.

7. Machine Design. This course is an application of principles already acquired to problems in design, each student being required to complete every detail of the design undertaken.

The subjects taken as design problems are: The design of a boiler; permanent and temporary fastenings for machine parts; a crank; a large shaft with pulley and gear wheels, rotating and sliding pieces, etc. The constructive details and calculations are discussed and the limitations of theoretical and empirical formulæ pointed out. Results are made to conform with experience and the best practice. One lecture-recitation hour and three drawing hours per week during the Senior year.

9. Engineering Laboratory. A course of practical work in testing general engineering apparatus for efficiency. The work consists in indicating steam engines; determining the evaporative efficiency of boilers; tests on the strength of materials; measurement of the flow of water; gas engine brake tests; refrigeration tests; and fuel value determinations. Students will be encouraged to adjust their machines for as wide a range of operations as possible, and a careful study will be made of the resulting effect on the efficiency. The student's observations and computations on any test are critically compared with those of the instructor. Six laboratory hours per week for the last half of the Junior year.

10. Engineering Laboratory. This course is a completion of Course 9. Six hours a week during the Senior year.

12. Elements of Steam Engineering. A course designed for the needs of Civil Engineering students. It deals briefly with valve gears, power plant accessories, thermodynamics, steam engines, steam pumps, and steam boilers. Two lecture-recitation hours per week during the Senior year.

Second Section. For Undergraduates and Graduates.

20. Steam Engineering. The first half year of the course deals with the principles of Thermodynamics; the properties of gases and vapors, especially steam; the flow of steam and other fluids, and the steam injector.

The application of the above principles is discussed, and the simple, compound, and multiple expansion steam engines are studied. A careful study is also made of available data from efficiency tests.

The last half year of the course is devoted to the study of steam boilers and power plants, and their accessories. A design, with plans and specifications, for a power plant of industrial proportions is required from each student. Three lecture-recitation hours per week during the Junior year.

22. Internal Combustion Motors. This course will deal with the theory, design, and practice concerning gas, gasoline, and other engines.

The work will include: (1) The fuels employed, their energy content, and its conversion into mechanical work; (2) the cycle of operations of the heat medium, with details of method of transforming heat into work, and types of motor; (3) the practical details of operation, mixing the charge, carburation, ignition, and governing; (4) the manipulation and practice, and a discussion of economy and performance from tests. The design of some simple type of motor will be completely worked out and discussed. Three lecture-recitation hours per week for the first half of the Senior year.

23. Hydraulic Machinery. This course provides for an elementary study of hydraulic prime movers and pumping machinery. It includes a discussion of the theory and design of turbines and turbine blades for low and high heads, and turbine governors.

The course will also treat of impulse wheels; water motors of the piston type; machinery for the utilization of hydraulic pressure; hydraulic pressure pumps, and hydraulic presses; hydraulic tools; pumps operated by steam, electricity, or power; and high duty pumps and water meters. Two lecture-recitation hours per week for the first half of the Senior year.

24. Technical Machinery. This course is intended to provide the engineering student with a knowledge of the method of operation of various types of technical machinery and the essential accessories of the same.

The fundamental features of each type will be discussed, the best practical example of each being used as a basis. In this way a correct conception of the proper manipulation and operation of such machinery will be secured. One lecture hour per week for the first half of the Senior year.

25. Compression and Refrigeration Machinery. A course in which the principles of thermodynamics are applied to the commercial methods of compressing air and securing artificial refrigeration. The work will also include the mechanical principles concerned in the design of air compressors as well as the transmission of air in high pressure piping.

The relative advantages of refrigeration systems will be discussed,

as brought out in the theory and practice of actual machines using ammonia, air, and other gases, and fluids. Three lecture-recitation hours per week in the last half of the Senior year.

28. Industrial Management. A course dealing with the business systems of manufacturing establishments.

The work includes a study of the organization and relations of the various departments of an industrial establishment, both in the office and in the workshop. It also discusses the conduct of accounts, the methods of superintendence and of compensating labor, the determination of the costs of production, and the effect on costs of different systems of distributing indirect expenses. One lecture-recitation hour per week for the last half of the Senior year.

METEOROLOGY.

CLEVELAND ARBE, A.M., LL.D.....*Professor*

Third Section. Primarily for Graduates.

40. Experimental and Laboratory Work in Meteorology. The theories of instruments and the laws of atmospheric phenomena, so far as they are susceptible of elucidation by laboratory experiment.

41. Practical Meteorology. Cartography; daily weather charts; methods of predicting the weather for a few days; long-range predictions for seasons, methods of verification; the climates of past geological ages; the methods of reduction and publication.

42. Physical and Theoretical Meteorology. The present state of our knowledge of atmospheric phenomena as problems in thermodynamics and hydrodynamics, culminating in Bierknes' treatment of the atmosphere as a field of force. An extensive course of reading and private study is marked out for the pupil, and his thesis for the degree of Ph.D. must be in the field of physical meteorology.

PHILOSOPHY.

JAMES MACBRIDE STERRETT, A.M., D.D.....*Professor*
 WILLISTON S. HOUGH, Ph.M.....*Professor*
 GEORGE LANSING RAYMOND, L.H.D.....*Professor of Aesthetics*
 SHEPHERD IVORY FRANZ, Ph.D....*Professor of Experimental Psychology*
 WILLIAM T. HARRIS, LL.D.....*Lecturer*

First Section. Primarily for Undergraduates.

NOTE.—Elementary courses in Logic and Psychology are given in connection with English 1 and 2. (See courses 9 and 10 under "English.")

1a. The Principles of Science. A study of the structure of knowledge and of the methods of exact science. Text-book, with lectures. *Mon.*, at 9.30; *Wed.*, at 9.00; *Fri.*, at 9.30. First half year. Professor HOUGH.

1b. Psychology. General Course, with emphasis of the psychological principles underlying ethical, educational, and sociological theory. Text-book, supplemented by lectures. *Mon.*, at 9.30; *Wed.*, at 9.00; *Fri.*, at 9.30. Second half year. Professor HOUGH.

2. Educational Psychology. (Either course 1 or 2 under "Education.")

Second Section. For Undergraduates and Graduates.

20. Epistemology. Lectures on the theory of knowledge of the Greek philosophers and first-hand study of the theories of Descartes, Locke, Berkeley, and Hume. First half year. *Mon.*, at 10.30; *Wed.*, at 10. Professor STERRETT.

21. The Kantian Epistemology. Lectures based on a critical study of the text of Kant's Critique of Pure Reason. Knowledge of German is desirable. Second half year. *Mon.*, at 10.30; *Wed.*, at 10. Professor STERRETT.

22. The History and Psychology of Religion. Lecture course with prescribed readings and a thesis. *Tu.*, *Th.*, at 10.30.

23. Plato. A critical reading of a number of the shorter dialogues with a special study of The Republic. Lectures with abstracts and a thesis. One hour. Professor STERRETT.

24. History of Philosophy. An outline of the evolution of philosophic thought from early Greek times to the close of the 19th century. Parts of Rogers' "Student's History of Philosophy," supplemented by lectures and assigned reading. *Tu.* and *Th.*, at 9.30. First half year. Professor HOUGH.

25. Ethics. The science of moral conduct. Special attention will be given to the following topics: the cognitive factors of conduct; the origin and authority of moral standards; the theories of the moral end; the nature of conscience; the system of the virtues; and the social aspects of morality. Text-book, supplemented by lectures and topical reference work. Theses. *Tu.* and *Th.*, at 9.30. Second half year. Professor HOUGH.

26. Greek and Christian Ethics. Critical reading of selected Dialogues of Plato and 6 Books of Aristotle's Ethics, with introductory lectures on the development of moral ideas from Homer to the Roman Stoics, and a sketch of Christian ethics. *Tu.* and *Th.*, at 9.30. First half-year. Not given in 1907-08. Professor HOUGH.

27. Social Psychology. An analysis of the social self and of the psychological factors in the life of society. Introductory to sociological

and political theory. Parts of Baldwin's "Social and Ethical Interpretations in Mental Development," with lectures. Two hours. Second half year. Not given in 1907-98. Professor HOUGH.

28. The History of Political Theories. With special reference to the evolution of Civil Rights and Popular Sovereignty. Designed primarily for students in the College of the Political Sciences, but open to students in Columbian College who have passed in Philosophy "1." One hour per week throughout the year. Not given in 1907-08. Professor HOUGH.

30. Aesthetics. Lectures on the Principles of Art in general, as illustrated by those of poetry in particular. First half year. *Wed.*, at 4.50. Professor RAYMOND.

Third Section. Primarily for Graduates.

40. The Philosophy of Nature. Seminary course. The fundamental concepts of modern physical science; prescribed readings, reports, and a thesis. Professor STERRETT.

41. The Philosophy of Kant. A Seminary course covering Kant's three Critiques. Professor STERRETT.

42. Metaphysics. The Problems of Ontology, Cosmology, and Rational Psychology. Half year. Professor STERRETT.

43. The Philosophy of Religion. A lecture course with reports on prescribed readings and a thesis. Professor STERRETT.

44. The Philosophy of History. Seminary course. Conferences, prescribed readings and thesis. Dr. HARRIS.

45. Kant and Hegel. A Seminary course on their ethical theories. Professor STERRETT.

46. Aesthetics. Seminary course. Aesthetics, considered philosophically, historically, and practically. Conferences, prescribed readings, and thesis. Professor RAYMOND.

47. The Theory of the State. Graduate Conference. Special attention will be given to the theory of sovereignty. Part of Burgess's "Political Science," Vol. I, and Merriam's "History of the Theory of Sovereignty Since Rousseau," supplemented by reports upon collateral reading and discussions. Conferences, *Fri.*, 4.50 to 6.30. Two hours credit. First half year. Professor HOUGH.

48. The Principles of Political Obligation. (In sequence to Course 47.) The moral basis of the state, the grounds of political obligation, the moral ends served by civil law, and the system of public and private rights, will receive particular consideration. Green's "Principles of Political Obligation," with topical reference work and discussions. Conferences, *Fri.*, 4.50 to 6.30. Second half year. Professor HOUGH.

(Courses 47 and 48 are designed primarily for students in the College of the Political Sciences, but are open to duly qualified graduates of Columbian College.)

49. Educational Psychology. (See course 40 under "Education.")
Professor HOUGH.

50. Crucial Problems in Psychology. Designed for graduates taking a major in psychology. Professor HOUGH.

51. Logic from the Genetic Standpoint. Studies in the latest developments of logical theory will be arranged for qualified graduates.
Professor HOUGH.

52. Experimental Psychology. A Laboratory course, treating special topics in psychology, such as memory, time of mental processes, movement, sensation, emotion, etc. The topics selected for consideration in any year will be determined by the need of the students electing the course. Pre-requisite, Course 1, or its equivalent. Professor FRANZ.

53. Experimental Psychology. A research course. Open only to students who have taken or are taking Course 52 or its equivalent in another institution. Students will take up topics for original investigation under the direction of the instructor. Courses 52 and 53 will be given in the psychological laboratory of the Government Hospital for the Insane, which is well provided for psychological teaching and research.
Professor FRANZ.

PHYSICS.

HOWARD L. HODGKINS, Ph.D.	Professor
EDWARD B. ROSA, Ph.D.	Professor
EDGAR BUCKINGHAM, Ph.D.	Lecturer
EVERETT W. VARNEY, A.B.	Instructor

First Section. Primarily for Undergraduates.

1. General Physics. A recitation and lecture course, embracing the fundamental principles of mechanics, sound, heat, light, and electricity. The lectures are illustrated by experiments. Plane trigonometry is used in the course, and only students who have completed or are studying a college course in trigonometry are admitted. *Mon., Wed., Fri., at 4.50.* Professor HODGKINS.

2. Laboratory Physics. A selected series of experiments, mainly quantitative. This course is designed to familiarize the student with the ordinary methods of exact experimentation, and to extend the knowledge of the principles of physics as gained in Course 1. Two two-hour periods. *Tu., Th., at 10.30.* Professor HODGKINS and Mr. VARNEY.

Second Section. For Undergraduates and Graduates.

20. Sound. A lecture and laboratory course. Three periods. *Mon.*, at 10.30; *Wed.*, at 10; *Fri.*, at 10.30. Professor HODGKINS.

21. Heat. A lecture and laboratory course, based on Preston's Theory of Heat and Poynting and Thomson's Heat. Three periods. *Mon.*, at 11.30; *Wed.*, at 11; *Fri.*, at 11.30. Professor HODGKINS.

22. Light. A lecture and laboratory course, based on Preston's Theory of Light and Schuster's Theory of Optics. Three periods. *Mon.*, *Wed.*, *Fri.*, at 5.40. Professor HODGKINS.

Third Section. Primarily for Graduates.

40. Light. Advanced study, experimental and mathematical, of some one branch of the subject. Professor HODGKINS.

41. Absolute Electrical Measurements. A course of lectures on the theory and practice of fundamental electrical measurements, including the more important methods for the measurement of resistance in absolute units, the absolute measurement of current and electromotive force, the determination of the ratio of the two systems of electrical units, the theory of various forms of condensers, the calculation of inductances from their dimensions, the experimental determination of capacities and inductances, and other important problems in electrical measurements. A brief history of the present electrical units and an account of the classical investigations by which their values have been determined will also be given. Professor ROSA.

42. Advanced Laboratory Work in Electrical Measurements. A course in advanced laboratory work in electrical measurements, for those who are qualified to undertake it. This may include a considerable range of work, or it may be research work on some important single subject. The amount and character of the work and the time and place at which it shall be done will be determined for each case separately. Professor ROSA.

43. Thermodynamics. The first term is devoted to the development of the theory and usual methods of thermodynamics for systems devoid of passive resistances. The second term is occupied with applications to problems in Physics and Physical Chemistry. Among the subjects discussed the following may be mentioned: Thermal properties of fluids, specific and latent heats, the plug experiment; change of state, heterogeneous dissociation, the phase rule; reactions in gas mixtures, homogeneous dissociation, theory of gas and other explosive engines; electromotive forces; thermodynamic properties of bodies in the electric or magnetic field; laws of radiation. Dr. BUCKINGHAM.

41. Theory of Electricity and Magnetism. Maxwell's Electricity and Magnetism is used as a text-book. In the later part of the year some use will be made of Heaviside's Electromagnetic Theory. Familiarity with the rudiments of vector analysis is desirable, but not essential. Dr. BUCKINGHAM.

PREVENTIVE MEDICINE.

GEORGE N. STERNBERG, M.D., LL.D. *Professor*

Third Section. Primarily for Graduates.

40. Food preservatives in relation to the Public Health.
41. The hygienic results of milk sterilization.
42. The hygienic results of filtration of municipal water supplies.
43. The use of chemical agents for the sterilization of water supplies, municipal or domestic.
44. The results of legislative and philanthropic efforts to arrest the progress of tuberculosis in the United States, and especially in the principal cities.

ROMANCE LANGUAGES AND LITERATURES.

GEORGE N. HENNING, A.M. *Professor*

OSCAR L. KEITH, A.M. *Instructor*

FRENCH.

First Section. Primarily for Undergraduates.

1. Grammar, composition, drill in pronunciation. Fraser and Squair's French Grammar. Translation and reading of nineteenth century fiction and history. (400-500 pages.) For beginners. *Tu., Th., Sat., at 9.30.* Mr. KEITH.
2. Parallel with Course 1. *Tu., Th., Sat., at 5.40.* Mr. KEITH.
3. Translation and reading: Mérimée, *Colomba*; Sandeau, *Mlle de la Seiglière*; Daudet, *Trois Contes*; Sarcey, *le Siège de Paris*; A. France, *Sylvestre Bonnard*; Molière, *l'Avare*; Loti, *Ramuntcho*; Coppée, *le Pater*; for outside reading, Zeller, *Henri IV* or *Richelieu*. Grammar, composition, conversation; Fraser and Squair's French Grammar. Open to students who have passed in French 1 or 2, or have fulfilled the admission requirements in Elementary French. *Mon., 10.30; W'ed., 10; Fri., 10.30.* Professor HENNING.
4. Parallel with French 3. *Tu., Th., Sat., at 4.50.* Mr. KEITH.
6. General survey of French literature, seventeenth to nineteenth centuries. Translation, collateral reading and reports thereon, lectures

on literature and the history of the language, composition. Warren's French Prose of the Seventeenth Century, Canfield's French Lyrics, Lacombe's *Petite Histoire du peuple français*, Crane's *la Société française au XVIII^e siècle*, Corneille, Molière, La Fontaine, Racine, Saint-Simon, Montesquieu, Marivaux, Voltaire, Rousseau, Beaumarchais, Hugo, Musset, Michelet, Balzac, Augier, Maupassant, Pailleron, A. France, Bornier, Daudet. Open to students who have passed in Course 3 or 4, or have fulfilled the admission requirements in Advanced French. *Mon., Wed., Fri.*, at 2.30. Professor HENNING.

Second Section. For Undergraduates and Graduates.

Courses in this group are open to students who have passed in Course 6, or who otherwise satisfy the instructor of their fitness to take them.

21. Seventeenth century literature; history, philosophy, criticism, memoirs, letters, eloquence, drama, fiction, poetry. Balzac, Descartes, Pascal, La Rochefoucauld, La Bruyère, Boileau, St. Simon, Mme. de Sévigné, Bossuet, Corneille, Racine, Molière, Fénelon, Malherbe, La Fontaine, etc. Translation, collateral reading and reports thereon, lectures on literature and history. Thesis. Not given in 1907-08. Given in 1908-09. Professor HENNING.

23. Eighteenth century literature; history, philosophy, criticism, letters, drama, fiction, poetry. Montesquieu, Diderot, Rousseau, Voltaire, Marivaux, Destouches, Sedaine, Beaumarchais, Bernardin de St. Pierre, André Chénier, etc. Translation, collateral reading and reports thereon, lectures on literature and history. Thesis. Not given in 1907-08.

25. Nineteenth century, literature; history, philosophy, criticism, memoirs, travels, fiction, drama, lyric poetry. Thierry, Michelet, Mignet, Thiers, Taine, Sainte-Beuve, Brunetière, France, Lemaitre, Renan, Gautier, Mme. de Staël, Chateaubriand, Dumas père, Hugo, George Sand, Mérimée, Balzac, Flaubert, Daudet, Maupassant, Loti, de Musset, Dumas fils, Augier, Maeterlinck, Rostand, Lamartine, de Vigny, the Romantic poets, the Parnassians, the Symbolists, etc. Translations, collateral reading and reports thereon, lectures on literature and history. Thesis. *Mon.*, at 11.30; *Wed.*, at 11; *Fri.*, at 11.30. Professor HENNING.

26. French Romanticism; lyric poetry, fiction, drama, history, criticism. Translation, reading, lectures. This course may be taken only in conjunction with English 26. Given in 1907-08. Not given in 1908-09. *Tu., Th.*, 10.30. Professor HENNING.

Third Section. Primarily for Graduates.

43. Old French and philology. Darmesteter's Historical French Grammar. *La Chanson de Roland*, etc. Professor HENNING.

47. The comedies of Molière. Professor HENNING.

50. The Romantic Movement in France, with some reference to the same movement in England and Germany. Professor HENNING.

Other courses may be arranged for competent graduates.

SPANISH.

First Section. Primarily for Undergraduates.

1. Grammar, composition. Hills and Ford's Spanish Grammar. Translation and reading of nineteenth century fiction and drama. Open to first-year students only by permission of the instructor. Open only to students who have had at least one year of French or Latin. Students may not elect Spanish and Italian in the same year. *Tu., Th., Sat., at 10.30.* Mr. KEITH.

Second Section. For Undergraduates and Graduates.

20. Translation and reading of nineteenth and seventeenth century works; history, fiction, drama, lyric poetry. Lectures on literature and history. Open to students who have passed in Course 1 with at least the grade of C, or who otherwise satisfy the instructor of their fitness to take the course. Given in 1907-08. *Tu., Th., 11.30.* Professor HENNING.

ITALIAN.

First Section. Primarily for Undergraduates.

1. Grammar, composition. Grandgent's Italian Grammar, Bowen's Italian Reader. Translation and reading of nineteenth century fiction and drama. Open to first-year students only by permission of the instructor. Open only to students who have had at least one year of French or Latin. Students may not elect Italian and Spanish in the same year. Not given in 1907-08.

FRENCH CLUB.

The French Club, composed of instructors and advanced students in the department, and of alumni, has for its objects the study of French life, customs and history, and the use of the spoken language. Meetings are held monthly.

SEMITIC LANGUAGES AND LITERATURES.

FRANK LEIGHTON DAY, Ph.D.....Professor

First Section. Primarily for Undergraduates.

1. History of the Hebrews. This course covers the history of Israel from the beginning to the Maccabean Age, in successive steps: (a)

From the beginning to Solomon. (b) From Solomon to Nehemiah. *Tu., Th.*, at 10.30.

2. New Testament Times. Including the political, social, and religious life from B. C. 175 to A. D. 70. *Tu., Th.*, at 11.30.

3. Biblical Archæology.

4. History of the English Bible.

Second Section. For Undergraduates and Graduates.

20. A Course for Beginners in Hebrew. Including the acquisition of the grammatical principles of the language, the vocabulary, and careful reading of Genesis, chapters I-VIII. Harper's Introductory Hebrew Method and Elements of Hebrew are used as text-books. *Tu., Th., Sat.*, at 9.30.

21. Historical Hebrew. The Books of Kings, a critical translation; special attention given to vocabulary and syntax. This course is a continuation of Course 20.

22. Prophecy. Its History and Development. This course includes the special study of some of the prophetic books, with the life and times of the writers. *Mon.*, at 10.30; *Wed.*, at 10.

23. Priestly Element in the Old Testament. *Mon.*, 9.30; *Wed.*, 9.

24. The Psalms. A study of the Psalms as to date, structure, contents, and special teachings.

Third Section. Primarily for Graduates.

40. The Minor Prophets. A course for advanced students in Hebrew, including Hebrew lexicography, etymology, and syntax.

41. Jeremiah. The life and times of the writer and critical study of the book.

42. Religion of the Semites.

43. The wisdom literature in the Old Testament.

Other courses may be arranged for competent graduates.

SOCIOLOGY.

(See statement under Economics and Sociology.)

SPANISH.

(See statement under Romance Languages.)

ZOOLOGY.

THEODORE NICHOLAS GILL, M.D., Ph.D., LL.D.....	Professor
PAUL BARTSCH, M.S., Ph.D.....	Professor
JULIA T. MACMILLAN.....	Assistant

First Section. Primarily for Undergraduates.

1. Systematic Zoology. I. Invertebrates. This includes lectures and laboratory work. The lectures in their scope cover all the branches of Invertebrates, and correlated with these lectures is the study and dissection of typical specimens in each group. This course is intended to familiarize the student with biological characters, classificatory laws, and the general principles of evolution. Lecture, one hour; laboratory, two two-hour periods. *Mon. Wed., Fri., at 5.40.* Professor BARTSCH.

2. Systematic Zoology. II. Vertebrates. This includes lectures and laboratory work. The lectures will cover the various branches of Vertebrata and correlated with these is the study and dissection of typical specimens of each group. Open only to students having completed Course I. *Mon., Wed., Fri., at 4.50.* Professor BARTSCH.

Second Section. For Undergraduates and Graduates.

20. Practical Zoology. A lecture course illustrated with lantern slides and demonstrations. In this course only beneficial and injurious animals of all classes will be considered, especial stress being laid upon the problems of preservation and extermination. The course aims to expound the economic side of zoology. Open to all students. One hour. Professor BARTSCH.

21. A Laboratory Course in Histology. This course is designed to acquaint the students with histological technique as well as the minute structure of the various organs composing the body of animals. Three hours. Professor BARTSCH.

22. A Laboratory Course in Physiology. This includes lectures and laboratory work. It considers the constituents of the body and the chemical changes which take place in the vital processes, as well as the secretions and excretions of the body. Professor BARTSCH.

23. Ornithology. A systematic course embracing lectures and laboratory work. The lectures are illustrated with lantern slides, showing the home life of birds. The laboratory work consists in classifying bird skins, of which the University possesses an excellent series. Special attention is directed to the study of the birds of the District of Columbia, and frequent field excursions are made to familiarize the student with the haunts and habits of these forms. Lecture, one hour; laboratory, one two-hour period. *Tu., Th., at 4.50.* Professor BARTSCH.

24. Comparative Biology. This course consists of lectures and class-room demonstrations treating of the different functions and phenomena of life as they are exhibited in both animals and plants. The lectures are given by the Professor of Zoölogy and the Professor of Botany alternately. *Wed.*, at 4.50. Professors BARTSCH and MANN.

Third Section. Primarily for Graduates.

40. A general course of lectures on the principles of zoölogy, including a consideration of the philosophy, the methods of investigation, and the systems of zoölogy as determined by comparative anatomy. The lectures are supplemented by work in the laboratory, embracing histology, microtomy, and dissection. The student is required to take up some subject or group for original investigation.

The collections of the United States National Museum and the Smithsonian Institution are consulted in connection with all these courses.

EXAMINATIONS.

Examinations are conducted under the following rules of the Board of Trustees:

Examinations for degrees shall close at least three weeks before the end of the scholastic year, and the names of all candidates for degrees who have passed a successful examination shall be officially reported to the President at least two weeks before the date of the commencement.

No student shall be credited with an examination for promotion from a lower to a higher class or to a final examination who is in arrears for tuition.

LIBRARY FACILITIES.

A well-equipped reference library and reading-room is open to students from 9 a. m. to 7 p. m. It contains encyclopædias, dictionaries, standard works in the various departments of study comprised under University subjects, and the leading literary and scientific magazines and reviews. The Germanic Library of the late Professor Richard Heinzel, of the University of Vienna, recently acquired by the University, contains 7,200 volumes and pamphlets bearing on Germanic philology and literature, and a large number of works and periodicals in the cognate branches, especially Anglo-Saxon, Old English, the Romance languages and Slavic.

The Library of Congress is steadily perfecting its collections of standard works in the various branches of university study, and advanced and graduate students are there given every facility for pursuing their investigations. The Public Library of the District of

Columbia is being rapidly equipped with books of especial importance to students, and its facilities are available under the most favorable conditions. Under certain restrictions, the libraries of the governmental departments may also be utilized. All these libraries are within easy reach of the University.

FEES.

ARTS AND SCIENCES.

1. Matriculation fee (payable only on first entry into the University)	\$5
2. Library fee per annum	2
3. Tuition fee per annum for regular undergraduate courses (12 hours or more per week) or for graduate courses during the years of required work	150
4. Laboratory courses:	
Material fees:	
Mineralogy	5
Botany; Chemistry, 2, 3, and 7; Electrical Engineering; Physics; Zoölogy; each.....	10
Chemistry, 4 (Assaying)	20
Chemistry, except 2, 3, 4, and 7, each.....	25
Deposits to cover breakage of apparatus issued, the amounts paid in excess of breakage to be returned:	
Chemistry, 2, 3, and 7, each.....	10
Chemistry, except 2, 3, 4, and 7, each.....	25
5. Fee for graduation	10
6. Tuition fees per annum, for all departments of the University, for special courses on the basis of hours per week throughout the year:	
One hour	25
Two hours	45
Three hours	60
Four hours	70
Five hours	80
Six hours	90
Seven hours	100
Eight hours	110
Nine hours	120
Ten hours	130
Eleven hours	140
7. Tuition fee for each of the following special courses, not taken by candidates for a degree.....	40
Architecture, Courses 37 and 38.	
Chemistry, Course 4 (Assaying).	

8. Tuition fee per annum for the special course in Architecture. . \$100
9. Tuition fee per annum for a regular undergraduate course
after four years of attendance at full tuition..... 75
10. In determining tuition fees, four hours of laboratory work in
Architecture, three hours of laboratory work in Chemistry,
and two hours of laboratory work in other subjects count
as one hour.
11. Fee for a certificate under the seal of the University..... 2

No change will be made in the fees fixed at the time of registration except in the case of a change in or withdrawal from a course of studies, and then only upon notice in due form and from the end of the current quarter session when such change or withdrawal shall be approved. Applications for permission to change a course of studies or for the granting of a withdrawal should be made on the prescribed form to be obtained from the Registrar and will only be received at the end of a quarter session.

PAYMENT OF FEES.

All fees are to be paid to the Treasurer. Tuition fees are payable quarterly in advance. Matriculation, library, and laboratory fees are payable in full in advance.

BOARD AND ROOMS.

A register of approved boarding houses is kept by the Treasurer. Accommodations cost from \$25 to \$40 a month. Women students may apply to the Dean of Women.

HONORABLE DISMISSION.

An honorable dismission will always be issued to any student who has been granted a withdrawal from the University in good standing.

For catalogues, application blanks, and further information, address

THE REGISTRAR,
The George Washington University,
Washington, D. C.

Faculty of Medicine.

I. DEPARTMENT OF MEDICINE.

FACULTY.

(Arranged, with the exception of the President and the Dean, in the several groups in order of collegiate seniority.)

CHARLES WILLIS NEEDHAM, LL.D.	PRESIDENT OF THE UNIVERSITY
WILLIAM F. R. PHILLIPS, M.D.	Dean, Professor of Hygiene and of Practical Anatomy
* J. FORD THOMPSON, M.D.	Professor of Surgery
ALBERT F. A. KING, A.M., M.D., LL.D.	Professor of Obstetrics and Dean Emeritus of the Faculty
GEORGE N. ACKER, A.M., M.D.	Professor of Pediatrics and of Clinical Medicine
HENRY C. YARROW, M.D.	Professor of Dermatology
D. KERFOOT SHUTE, A.B., M.D.	Professor of Anatomy and of Clinical Ophthalmology
WILLIAM P. CAER, M.D.	Professor of Surgery
STERLING RUFFIN, M.D.	Professor of Theory and Practice of Medicine and of Clinical Medicine
WILLIAM K. BUTLER, A.M., M.D.	Professor of Ophthalmology
THOMAS E. MCARDLE, A.M., M.D.	Professor of Minor Surgery
JOHN VAN RENSSELAER, A.B., M.D.	Professor of Clinical Surgery
CHARLES EDWARD MUNROE, Ph.D.	Professor of Chemistry
CHARLES W. RICHARDSON, M.D.	Professor of Laryngology and Otology
GEORGE WYTHE COOK, M.D.	Professor of Clinical Medicine
J. WESLEY BOVER, M.D.	Professor of Gynecology
THOMAS A. CLAYTOR, M.D.	Professor of Materia Medica and Therapeutics and of Clinical Medicine
A. R. SHANDS, M.D.	Professor of Orthopedic Surgery
JAMES CARROLL, M.D.	Professor of Bacteriology and Pathology
RANDOLPH B. CARMICHAEL, M.D.	Professor of Clinical Dermatology
FRANCIS R. HAGNER, M.D.	Professor of Genito-Urinary Surgery and Venereal Diseases
JOHN B. NICHOLS, M.D.	Professor of Histology
WILLIAM C. WOODWARD, M.D., LL.M.	Professor of Medical Jurisprudence
ALBERT L. STAVELEY, M.D.	Clinical Professor of Gynecology

* On leave of absence.

WILLIAM A. WHITE, M.D.	Professor of Mental Diseases
CHARLES H. CLARK, M.D.	Professor of Nervous Diseases
I. W. BLACKBURN, M.D.	Professor of Morbid Anatomy
ARTHUR A. SNYDER	Clinical Professor of Surgery
SHEPHERD IVORY FRANZ, Ph.D.	Professor of Physiology
EDWARD E. MORSE, M.D.	Assistant Professor of Obstetrics
EDWARD G. SEIBERT, M.D.	Assistant Professor of Chemistry
JULIAN M. CABELL, M.D.	Assistant Professor of Obstetrics
D. WEBSTER PRENTISS, M.D.	Assistant Professor of Histology
C. S. WHITE, M.D.	Assistant Professor of Physiology
JOSEPH M. HELLER, M.D.	Lecturer on Diseases of the Tropics
JOHN R. WELLINGTON, M.D.	Assistant Professor of Clinical Surgery
JOHN H. LINDSEY, M.D.	Assistant Professor of Clinical Medicine
NOBLE P. BARNES, M.D.	Lecturer on Materia Medica
DUFF G. LEWIS, M.D.	Assistant Clinical Professor of Surgery
JOHN T. KELLY, M.D.	Assistant Clinical Professor of Surgery
T. S. D. GRASTY, M.D.	Assistant Professor of Bacteriology and Pathology
H. H. DONNALLY, A.M., M.D.	Assistant Professor of Bacteriology and Pathology
SAMUEL H. GREENE, JR., M.D.	Instructor in Anatomy
HOMER S. MEDFORD, M.D.	Instructor in Obstetrics
L. H. REICHELDERFER, M.D.	Instructor in Medicine
EDGAR P. COPELAND, M.D.	Instructor in Surgery
J. L. RIGGLES, M.D.	Instructor in Anatomy
H. C. MACATEE, M.D.	Instructor in Medicine
G. BROWN MILLER, M.D.	Instructor in Gynecology
W. A. FRANKLAND, M.D.	Instructor in Clinical Gynecology and Assistant Demonstrator of Anatomy
THOMAS M. PRICE, Ph.D.	Instructor in Bio-Chemistry
OTIS D. SWETT, B.S.	Instructor in Chemistry
L. H. TAYLOR, M.D.	Instructor in Surgery
HENRY R. ELLIOTT, M.D.	Instructor in Physiology
WALTER H. MERRILL, M.D.	Instructor in Electro-Therapeutics
B. M. RANDOLPH, M.D.	Instructor in Pharmacology
HURON W. LAWSON, M.S., M.D.	Instructor in Bacteriology and Pathology
O. A. M. MCKIMMIE, M.D.	Clinical Instructor in Laryngology and Ophthalmology
H. S. DYE, M.D.	Clinical Instructor in Laryngology and Ophthalmology
C. M. BEALL, M.D.	Instructor in Physical Diagnosis
H. C. CORBURN, M.D.	Instructor in Physical Diagnosis
ELMER S. NEWTON, M.D.	Instructor in Chemistry
A. BARNES HOOK, M.D.	Instructor in Gynecology

WILBUR R. BRANDENBURG, M.D.	Demonstrator of Bacteriology and Pathology
GEORGE B. HEINECKE, M.D.	Assistant Demonstrator of Anatomy
EDWARD ELLIOTT RICHARDSON, M.D., M.S.	Assistant Demonstrator of Anatomy
HENRY M. JEWETT, M.D.	Assistant Instructor in Histology
J. LAWN THOMPSON, M.D.	Assistant Instructor in Surgery
TRUMAN ABBE, M.D.	Assistant Instructor in Physiology
CHARLES W. HYDE, M.D.	Assistant in Surgery
A. L. HUNT, M.D.	Assistant in Surgery
E. T. M. FRANKLIN, M.D.	Assistant in Surgery
W. J. FRENCH, M.D.	Assistant in Surgery
A. P. CLARK	Assistant in Chemistry
JOHN P. FREY	Assistant in Chemistry
F. P. MAGRUDER, A.M., M.D.	Assistant Demonstrator of Anatomy
DANIEL T. BIRTWELL, M.D.	Assistant Demonstrator of Anatomy
J. D. MURRAY, M.D.	Assistant Demonstrator of Anatomy
GLENN I. JONES, M.D.	Assistant Demonstrator of Anatomy
W. O. OWEN, M.D.	Assistant Demonstrator of Anatomy
W. E. CLARK, M.D.	Assistant in Bacteriology and Pathology

UNIVERSITY HOSPITAL.

VISITING STAFF.

* J. FORD THOMPSON, M.D.	Visiting Surgeon
W. P. CARR, M.D.	Visiting Surgeon
STERLING RUFFIN, M.D.	Visiting Physician
THOMAS A. CLAYTOR, M.D.	Visiting Physician
GEORGE N. ACKER, M.D.	Visiting Physician
A. F. A. KING, A.M., M.D., LL.D.	Visiting Obstetrician
HENRY C. YARROW, M.D.	Visiting Dermatologist
D. KERFOOT SHUTE, M.D.	Visiting Ophthalmologist
CHARLES W. RICHARDSON, M.D.	Visiting Laryngologist
J. WESLEY BOVEE, M.D.	Visiting Gynecologist
W. K. BUTLER, M.D.	Associate Visiting Ophthalmologist
JULIAN M. CABELL, M.D.	Associate Visiting Obstetrician
JAMES CARROLL, M.D.	Pathologist

OUT-PATIENT DEPARTMENT.

SURGICAL DISPENSARY.

J. L. RIGGLES, M.D.	In charge
E. L. MASON, M.D.	Assistant
C. W. HYDE, M.D.	Assistant
C. F. STEARNE, M.D.	Assistant

* On leave of absence.

MEDICAL DISPENSARY.

JOHN H. LINDSEY, M.D.....	In charge
E. P. COPELAND, M.D.....	Assistant
W. A. FRANKLAND, M.D.....	Assistant
S. H. GREENE, JR., M.D.....	Assistant
H. C. COBURN, M.D.....	Assistant
B. M. RANDOLPH, M.D.....	Assistant
C. M. BEALL, M.D.....	Assistant
H. H. DONNALLY, M.D.....	Assistant
C. W. HYDE, M.D.....	Assistant

GYNECOLOGICAL DISPENSARY.

A. B. HOOE, M.D.....	In charge
D. W. PRENTISS, M.D.....	Assistant
SAMUEL FRY, M.D.....	Assistant
ADAM KEMBLE, M.D.....	Assistant

EYE, EAR, THROAT, AND NOSE DISPENSARY.

E. G. SEIBERT, M.D.....	In charge
C. L. BILLARD, M.D.....	Assistant

GENITO-URINARY DISPENSARY.

HENRY R. ELLIOTT, M.D.....	In charge
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SKIN DISEASE DISPENSARY.

RANDOLPH B. CARMICHAEL, M.D.....	In charge
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GENERAL STATEMENT.

In the chronological order of establishment the Department of Medicine of The George Washington University is the seventeenth Medical School in the United States. The first course of lectures began in March, 1825. For many years the school was known as the National Medical College; subsequently as the Department of Medicine of the Columbian University. By virtue of an Act of Congress approved January 23, 1904, the Columbian University changed its name to "The George Washington University."

When first established, and for many years thereafter, this school, like most others in this country, gave only a two years' course of five months each. In 1878 the course was lengthened by the establishment of a Spring Session, devoted to lectures in certain special subjects.

Again in 1870 the course was lengthened to seven months and attendance upon three annual sessions required; in 1893 attendance upon four regular courses was made obligatory upon all candidates for the degree of Doctor of Medicine. The present course of instruction for the degree of Doctor of Medicine extends through four years of eight months each. In order to increase the facilities for actual bedside teaching, the University Hospital was established in 1898 and made a part of the Department of Medicine. In 1902 the old building, in which the exercises had been held since 1867, gave place to the present enlarged and commodious structure.

The academic year begins on the last Wednesday in September and ends on the first Wednesday in June. The next session, the eighty-seventh, begins September 25, 1907, and ends June 3, 1908. Students must register their names promptly at the Registrar's office at the beginning of the session, in order that their time of study shall count as a full year. Degrees are conferred at Commencement, the first Wednesday in June; at the Fall Convocation, the second Wednesday in October, and at the Winter Convocation, February 22.

For catalogues and other information address either the Registrar of the University or the Dean of the Department of Medicine, The George Washington University, Washington, D. C.

ADMISSION.

Candidates for matriculation must show that they are fitted by previous education to study medicine.

Advanced Requirements After 1909.

Beginning with the session of 1909-10 no student will be matriculated for the degree of Doctor of Medicine (a) who has not completed satisfactorily in an approved college or scientific institution two years of work of a regular course for a baccalaureate degree or (b) who does not possess equivalent educational training and acquirements.

Applications for matriculation will be required (a) to submit certificates, duly authenticated, of the college or scientific institution in which their work was done, setting forth the courses taken and the grades attained or (b) to pass satisfactorily examinations equivalent to the final examinations in subjects of the sophomore year of approved colleges or scientific institutions and aggregating fifteen units. In both cases, (a) and (b), one unit must be in physics and one unit in chemistry.

Admission Without Examination.

Candidates are admitted without examination:

(1) Upon presenting a diploma or certificate of an approved college conferring on them the degree of A.B. or B.S., or an equivalent degree in the arts and sciences.

(2) Upon presenting a diploma or certificate of graduation from a high school, academy, or preparatory school approved by the University as maintaining an adequate standard.

(3) Upon presenting a certificate of admission to the freshman class of an approved college.

(4) Upon presenting a medical student's certificate issued by a State board.

(5) Upon presenting a certificate of admission to another medical school approved by the University as maintaining an adequate standard.

Admission by Examination.

Candidates unable to comply with the foregoing requirements are admitted upon passing an examination based upon the general requirement for admission to the Freshman Class of the Columbian College of the University, which is a four-year high school course, or its equivalent. This examination comprises subjects selected from the annexed list equal to 15 units. For admission to the Department of Medicine nine (9) of the 15 units are required in the following subjects:

	Units.
English	4
Mathematics	3
Physics	1
Latin, French, or German	1
Total.....	9

The other 6 units may be selected from the other subjects. A unit is considered the equivalent of one year's high school work in a subject.

List of Subjects.**English:**

	Units.
(a) Grammar	1
(b) Rhetoric and Composition	1
(c) Literature—a knowledge of the form, subject-matter, and literary history of prescribed works is required	2

The following are the works prescribe dfor 1907-08: Burke's *Speech on Conciliation*, Macaulay's *Essay on Milton*, Macaulay's *Life of Johnson*, Milton's *L'Allegro*, *Il Penseroso*, *Comus*, and *Lycidas*; Shakespeare's *Julius Caesar*. Equivalent readings may be offered.

Latin:

	Units.
(a) Elementary Grammar	1
(b) Cæsar's Commentaries, Books I-IV.....	1
(c) Advanced Latin	2

Greek:

(a) Elementary Grammar	1
(b) Xenophon or Homer	1
(c) Advanced Greek	1

Modern Languages:

(a) Elementary French Grammar	1
(b) French, translation of easy prose.....	1
(c) Elementary German Grammar	1
(d) German, translation of easy prose.....	1

History:

United States	1
English	1
Greek or Roman	1
General	1

Mathematics:

(a) Algebra through quadratics	1½
(b) Plane Geometry	1
(c) Plane Trigonometry	½
(d) Advanced Mathematics	1

Sciences:

Physics	1
Chemistry	1
Astronomy	½
Biology	1
Geology	½
Botany	1

Sciences—*continued.*

	Units.
Physical Geography	$\frac{1}{2}$
Physiology	$\frac{3}{8}$
Ethics	$\frac{3}{8}$
Economics	$\frac{3}{8}$

The scope of the different subjects is indicated by standard high school text books.

Candidates may offer other subjects than those stated in the foregoing list of subjects, and if they are acceptable examinations will be arranged. A candidate may offer certificates of an approved school for work done in any of the foregoing subjects, and will be credited with the units represented by such work. A candidate failing to pass in two of the subjects of his examination may be admitted to the first year upon the condition that he make up the deficiency before entering the second-year class. The examinations are conducted by examiners appointed by the Superintendent of Schools of the District of Columbia.

As the laws relating to the preliminary educational qualifications required of students of medicine differ in many of the States of the Union, candidates are advised to make themselves familiar with the provisions of the medical statutes of the States in which they contemplate applying for license to practice. Attention to this precaution may save future embarrassment.

Examinations for admission to the first-year Medical class will be held in Hall No. 2 of the Medical Building, in accordance with the following schedules:

- May 27 and September 16, 10 a. m., English.
- May 28 and September 17, 10 a. m., Mathematics.
- May 29 and September 18, 10 a. m., Physics.
- May 31 and September 19, 10 a. m., Latin.
- June 1 and September 20, 10 a. m., Electives.

ADMISSION OF STUDENTS FROM OTHER SCHOOLS.

Students of other recognized and approved medical schools may be admitted to this school as follows:

Those qualified to enter the second year of their own school may be admitted to the second-year class of this school; those qualified to enter the third year of their own school to the third year of this school, and those qualified to enter the fourth year of their own school to the fourth years of this school: Provided, however, that the subjects pur-

sued by the applicants in their previous year or years are reasonably equivalent to those required in the same year or years of this school, and that the requirements for advancement from class to class are the equivalent of those in this school. Applicants may be required to submit to examination in all the subjects pursued by the previous class of this school.

ADVANCED STANDING.

No advanced standing can be given for degrees in Dentistry, Veterinary Medicine, or Pharmacy.

Students holding degrees in Arts, Science, or Philosophy, who in the course of study for their degrees have pursued studies in chemistry, physiology, anatomy, histology, bacteriology, or pathology, equivalent to the courses in these subjects in this school, may upon satisfactory evidence of their proficiency be credited with such studies.

SPECIAL STUDENTS.

Students, approved by the Dean, not candidates for the degree of Doctor of Medicine, may be admitted without examination to pursue any course they may elect. Such courses cannot, however, be subsequently considered as time spent in the course for the degree of Doctor of Medicine. Nor can such students enter upon the regular medical course without complying with all the regular requirements for admission.

WITHDRAWALS.

A certificate of work actually done will be given to any student wishing to withdraw or transfer to some other school during the session. Written notice of such withdrawal or transfer must be filed with the Dean at the time of requesting the certificate, and the student must have paid all fees and dues chargeable against him up to the end of the quarter in which he withdraws.

CLASSIFICATION OF STUDENTS.

Students are divided into four classes, according to their proficiency, and the time spent, viz., first year, second year, third year and fourth year. Students cannot advance to a higher class with more than one major and one minor condition. Students failing in any subject or subjects may be permitted at the next examination period a re-examination in the subjects in which they fail. The Faculty may dismiss any student from the school, if in its judgment such student be deemed an unsuitable person, intellectually or otherwise for the profession of medicine.

ORDER OF INSTRUCTION.

A change in the arrangement of the subjects of the curriculum went into effect with the session of 1905-06. This change was made in order to secure a more logical correlation of the subjects, enabling the student to utilize his time to better advantage.

The subjects studied in each year are shown in the following table:

First Year.	Second Year.	Third Year.	Fourth Year
Anatomy.	Organic and Physiological Chemistry.	Practice.	Clinical Medicine.
Histology.	Bacteriology.	Surgery.	Clinical Obstetrics.
Physiology.	Pathology.	Obstetrics.	Clinical Surgery.
General Chemistry.	Materia Medica.	Therapeutics.	Laryngology.
	Pharmacology.	Gynecology.	Otology.
	Hygiene.	Medical Jurisprudence.	Ophthalmology.
	Clinical Microscopy.	Clinics.	Dermatology.
	Physical Diagnosis.		Psychiatry.
			Pediatrics.
			Neurology.
			Tropical Diseases.

The greater part of the fourth year is devoted to clinical work in the hospitals. During this year, however, general instruction is also given in Mental Diseases, Neurology, Dermatology, Ophthalmology, Laryngology, and Otology. Not less than 1000 hours of clinical work are required.

Examinations are held at the end of each course.

Optional Five-Year Course.

Since the session of 1904-05 a five-year optional course has been offered. In this course the subjects, selected from the regular four-year course, are as follows:

First year.	Second year.	Third year.	Fourth year.	Fifth year.
Anatomy.	Physiological and organic Chemistry.	Bacteriology.	Practice.	Clinical Medicine.
Histology.	Physiology.	Pathology.	Surgery.	Clinical Obstetrics.
General Chemistry.	Materia Medica.	Hygiene.	Obstetrics.	Clinical Surgery.
	Pharmacology	Therapeutics.	Gynecology.	Laryngology.
		Medical Jurisprudence.		Otology.
		Clinical Microscopy		Ophthalmology.
		Physical Diagnosis.		Dermatology.
				Psychiatry.
				Pediatrics.
				Neurology.
				Tropical Diseases.

This course requires an average of not less than 800 hours annually.

ANATOMY.

D. KERFOOT SHUTE, A. B., M.D.	.....	Professor of Anatomy
W. F. R. PHILLIPS, M.D.	.....	Assistant Professor of Practical Anatomy
GEO. B. HEINECKE, M.D.	.....	Assistant Demonstrator of Anatomy
E. E. RICHARDSON, M.D., M.S.	.....	Assistant Demonstrator of Anatomy
W. A. FRANKLAND, M.D.	.....	Assistant Demonstrator of Anatomy
S. H. GREENE, JR., M.D.	.....	Instructor in Anatomy
J. L. RIGGLES, M.D.	.....	Instructor in Anatomy

E. P. MAGRUDER, A.M., M.D.....	<i>Assistant Demonstrator of Anatomy</i>
J. D. MURRAY, M.D.....	<i>Assistant Demonstrator of Anatomy</i>
GLENN I. JONES, M.D.....	<i>Assistant Demonstrator of Anatomy</i>
W. O. OWEN, M.D.....	<i>Assistant Demonstrator of Anatomy</i>
DANIEL T. BIRTWELL, M.D.....	<i>Assistant Demonstrator of Anatomy</i>

The course in Anatomy is given in a series of lectures, demonstrations, recitations from text-books, and practical laboratory work. The purpose of the lectures is to prepare the student for his practical work in the laboratory. The lectures are illustrated by lantern slides, models, charts, and diagrams. The class is divided into small sections for the purpose of demonstrating the bones, joints, actual dissections, and frozen sections. The student is required to dissect satisfactorily one lateral half of the cadaver. Throughout the course every opportunity is taken to emphasize the application of Anatomy to the practice of medicine in all its departments. The course is practically completed in the first year, but, realizing the fundamental importance of anatomy to medicine, review recitations and demonstrations are provided weekly during the second year.

Text-books: Cunningham's Text-book of Anatomy, Gray's Anatomy, Cunningham's Manual of Practical Anatomy.

Collateral reading: Quain's Anatomy, Spalteholz's Anatomy, Taylor's Applied Anatomy, Wiedersheim's Structure of Man.

HISTOLOGY.

JOHN B. NICHOLS, M.D.....	<i>Professor of Histology</i>
D. WEBSTER PRENTISS, M.D.....	<i>Assistant Professor of Histology</i>
HENRY M. JEWETT, M.D.....	<i>Assistant Instructor in Histology</i>

Instruction in Histology is given in the first half of the first year. The minute structure of the tissues and organs of the body is presented in a systematic course of lectures illustrated by means of the projection microscope and by the study of specimens under the microscope. Recitations are held upon the subjects shown and studied. Practical instruction is given in microscopical technique, the care and manipulation of the microscope, and the preparation of specimens.

Text-book: Nichols's Histology.

Collateral reading: Böhm and von Davidoff's Histology, Stöhr's Histology.

PHYSIOLOGY.

SHEPHERD IVORY FRANZ, Ph.D.	Professor of Physiology
C. S. WHITE, M.D.	Assistant Professor of Physiology
H. C. ELLIOTT, M.D.	Instructor in Physiology
TRUMAN, ABBE, M.D.	Assistant Instructor in Physiology

The course in Physiology consists of lectures, recitations, conferences, demonstrations, and laboratory exercises, during the second half of the first year. The lectures cover all the important facts and theories regarding bodily functions, and are illustrated by diagrams, models, and prepared specimens. Recitations are held on assigned parts of the text-book. Conferences are held weekly on special physiological topics, and for these exercises each student is required to prepare one thesis during the semester. In the laboratory each student performs a number of experiments on blood, on the circulation, on digestion, on the general functions of muscle and nerve, on the nervous system, and on the special senses. The student is required to make and keep records of the experiments, and these are criticized by the instructors. The class is divided into sections so that each student receives a large amount of personal attention. After the course in Normal Physiology, a series of review exercises is held in which special emphasis is laid on the relation of normal physiological function to the disturbances of function in disease, and upon the physiological action of drugs. It is intended in this way to bring the work of the Physiological Laboratory and other exercises into closer relation with the succeeding courses in Pathology, Therapeutics, and General Medicine.

Text-book: Howell's Physiology.

Collateral reading: Schafer's Physiology. Landois' Physiology, American Text-book of Physiology, Stewart's Physiology.

CHEMISTRY.

CHARLES E. MUNROE, Ph.D.	Professor of Chemistry and Toxicology
EDWARD G. SEIBERT, M.D.	Assistant Professor of Chemistry
THOMAS M. PRICE, Ph.D.	Instructor in Bio-Chemistry
OTIS D. SWETT, B.S.	Instructor in Chemistry
ELMER S. NEWTON, M.D.	Instructor in Chemistry
ALBERT P. CLARK	Assistant
JOHN P. FREY	Assistant

General Chemistry. A series of illustrated lectures accompanied by recitations and exercises, on theoretical, inorganic, organic, and technical chemistry. Tu., Th., Sat., at 4.50 p. m. Professor MUNROE, Mr. SWETT.

Organic Chemistry. A series of lectures and recitations on the acyclic and cyclic hydrocarbons and their derivatives, with special reference to physiology and medicine. *Tues., Fri., at 8.00 a. m.* Professor MUNROE.

Physiological Chemistry. A series of lectures and recitations on the proximate principles of the human body, such as the proteids, carbohydrates, fats, and the relation of the chemical constitutions of these bodies to physiological processes, together with a consideration of the principal secretions and excretions of the human body. Assistant Professor SEIBERT.

Analytical Chemistry. A brief course in qualitative and quantitative analysis, with a view to acquainting the student with those methods which may be applied in medicine and the special tests for the alkaloids. Professor MUNROE, Assistant Professor SEIBERT, Assistants CLARK and FREY.

Clinical Analysis. A laboratory course covering urinalysis, examinations of the gastric fluid, analyses of milk and of water, a study of alkaloidal reactions, and a practical examination of the chemical properties of the substances treated of in the course of physiological chemistry. Professor MUNROE, Assistant Professor SEIBERT, Assistants CLARK and FREY.

Volumetric Analysis. A brief laboratory course, introducing acidimetry and alkalimetry as a basis for quantitative examination of water, urine, and gastric fluids. Professor MUNROE and Dr. NEWTON.

Text-books: Holland's Medical Chemistry and Toxicology, Long's Text-books of Physiological Chemistry, Platt's Manual of Qualitative Analysis and Medical Chemistry.

Collateral reading: Simon's Manual of Chemistry, Hammarsten's Physiological Chemistry, Richter's Organic Chemistry, Barker's Text-book of Elementary Chemistry.

ADVANCED WORK.

Bio-Chemistry. A laboratory course in the chemical examination of some of the chief foodstuffs, the tissues and fluids of the body, and the products of certain organisms; also the isolation of the digestive enzymes and a study of their action *in vitro*. Dr. PRICE.

MATERIA MEDICA AND THERAPEUTICS.

THOMAS A. CLAYTOR, M.D.....	<i>Professor of Materia Medica and Therapeutics</i>
NOBLE P. BARNES, M.D.....	<i>Lecturer on Materia Medica</i>
WALTER H. MERRILL, M.D.....	<i>Instructor in Electro-Therapeutics</i>
B. M. RANDOLPH.....	<i>Instructor in Pharmacology</i>

This course is given in the second and third years.

Second year. (1) Lectures upon *Materia Medica*, including a demonstration of drugs and their preparations. (2) Recitations upon the preparations, their doses, and the various antidotes for poisons. (3) Practical exercises in prescription writing. (4) Demonstrations in the laboratory illustrating the physiological action of the more important drugs. (5) An optional course in Pharmacy is offered.

Third year. (1) Systematic lectures upon the physiological action of drugs and their effects in health and disease, their therapeutic uses, and their methods of administration. (2) Lectures and section demonstrations in electro-therapeutics. (3) Prescription writing, in which the students are given hypothetical cases for which to prescribe, the prescriptions being reported before the class for criticism and discussion.

Text-books: Wood's *Therapeutics*, Wilcox's *Materia Medica and Pharmacy*.

Collateral reading: Hare's *Practical Therapeutics*, Culbreth's *Materia Medica and Pharmacy*, Cushney's *Pharmacology*, Osborne's *Introduction to Pharmacology and Medicine*.

BACTERIOLOGY AND PATHOLOGY.

JAMES CARROLL, M.D. *Professor of Bacteriology and Pathology*

T. S. D. GRASY, M.D. *Assistant Professor of Bacteriology and Pathology*

H. H. DONNALLY, A.M., M.D. *Assistant Professor of Bacteriology and Pathology*

HURON W. LAWSON, M.S., M.D. *Instructor in Bacteriology and Pathology*

WILBUR R. BRANDENBURG, M.D. *Demonstrator of Bacteriology and Pathology*

W. E. CLARK, M.D. *Assistant*

The course in Bacteriology and Pathology is given in the second year.

In Bacteriology the work includes (1) the preparation of the various culture media, (2) the principles of disinfection and sterilization, and (3) the methods of cultivating, staining, and studying bacteria. Special attention is given to the pathogenic organisms.

The latter half of the session is devoted to Pathology. After the detailed study of inflammation, the diseases of the various organs are taken up in succession. For this purpose sections illustrating the various pathological conditions are carefully selected and given to the student to be stained, mounted, and studied under the immediate supervision of an instructor. These sections become the property of the student. The course terminates with the microscopical study of the several varieties of tumors.

A course in Clinical Microscopy is given at the conclusion of that in Pathology. It embraces the study of fresh and stained preparations of human blood in normal and pathological conditions; the Widal test for typhoid fever; the developmental stages of the malarial parasites in the blood and in the mosquito; the common forms of intestinal parasites and the microscopical examination of the urine.

Text-books: Abbott's Principles of Bacteriology, Durch's General Pathology, Ziegler's Pathological Anatomy.

ADVANCED WORK.

Advanced students who desire to continue the work are encouraged to undertake bacteriological and pathological studies of the cases that come to autopsy.

HYGIENE.

W. F. R. PHILLIPS, M.D.....*Professor of Hygiene*

The course in Hygiene is given principally by recitation from a prescribed text-book. Consideration is given to domestic and municipal sanitation and to the principles underlying legislative interference in matters of public health. The subject is taught in the second year.

Text-book: Harrington's Hygiene.

Collateral reading: Notter and Firth's Hygiene.

SURGERY.

* J. FORD THOMPSON, M.D.....*Professor of Surgery*
 W. P. CARR, M.D.....*Professor of Surgery*
 THOS. E. McARDLE, M.D.....*Professor of Minor Surgery*
 A. R. SHANDS, M.D.....*Professor of Orthopedic Surgery*
 E. P. COPELAND, M.D.....*Instructor in Surgery*
 L. H. TAYLOR.....*Instructor in Surgery*
 J. LAWN THOMPSON, M.D.....*Instructor in Surgery*
 CHARLES W. HYDE, M.D.....*Assistant in Surgery*
 A. L. HUNT, M.D.....*Assistant in Surgery*
 W. J. FRENCH, M.D.....*Assistant in Surgery*
 E. T. M. FRANKLIN, M.D.....*Assistant in Surgery*

The instruction given in this course embraces systematic lectures upon the principles and practice of surgery. Recitations are held twice a week, in which the subjects presented by the lecturer are impressed upon the students. The different surgical operations are illustrated upon the cadaver, and the uses of all the important surgical instruments and appliances are demonstrated in the same manner.

* On leave of absence.

Minor Surgery. Practical instruction is given in the application of splints, bandages, and dressings used in the various surgical diseases and injuries. Instruction is also given in the preparation of materials used in antiseptic and aseptic surgery, the preparation of the patient, sterilization of the instruments, and the methods of administering anesthetics.

Orthopedics. A course of lectures and recitations on the pathology, etiology, course, and termination of chronic joint diseases.

Surgical Pathology. A systematic series of demonstrations upon the pathological anatomy of surgical diseases and injuries is given. These demonstrations are supplemented by reference to microscopical specimens, charts, photographs, and diagrams.

Text-books: Brewer's Surgery, Walsham's Surgery, and Wharton's Minor Surgery.

Collateral reading: von Bergmann's System of Surgery, Park's Surgery by American Authors.

CLINICAL SURGERY.

* J. FORD THOMPSON, M.D.	.....	Professor of Clinical Surgery
W. P. CARR, M.D.	.....	Professor of Clinical Surgery
CHARLES W. RICHARDSON, M.D.	.....	Clinical Professor of Laryngology
JOHN VAN RENSSELAER, A.B., M.D.	.....	Clinical Professor of Surgery
W. K. BUTLER, M.D.	.....	Clinical Professor of Ophthalmology
D. KERECOT SHUTE, A.B., M.D.	.....	Clinical Professor of Ophthalmology
A. R. SHANDS, M.D.	.....	Clinical Professor of Orthopedic Surgery
FRANCIS R. HAGNER, M.D.	.....	Professor of Genito-Urinary Surgery
JOHN R. WELLINGTON, M.D.	.....	Assistant Clinical Professor of Surgery
ARTHUR A. SNYDER, M.D.	.....	Clinical Professor of Surgery
DUFF G. LEWIS	.....	Assistant Clinical Professor
JOHN T. KELLY	.....	Assistant Clinical Professor
L. H. TAYLOR, M.D.	.....	Clinical Instructor in Surgery

General Surgery. In the third year amphitheater clinics are given, at which the general principles of surgical diagnosis and of operative technique and procedure are emphasized and illustrated.

General and Special Surgery. In the fourth year the class is divided into sections for the study and examination of surgical cases in the hospital wards. The students are also assigned to work as dressers and assistants on the surgical out-patient departments of the different hospitals. Practical work is required of each student in preparation of dressings, sterilization of instruments, and operations on the cadaver. In the latter part of the year each student is given an opportunity to

* On leave of absence.

assist at a major operation. The clinical work is supplemented by the study and discussion of case histories.

In ophthalmology, otology, and laryngology the students are required to attend a certain number of clinics, and each student must report upon one assigned case.

In orthopedics they are required to take clinical instruction in the application of special apparatus and of plaster of paris to the correction of deformities.

Instruction in genito-urinary surgery and in cystoscopy is given in clinics in section work and by recitations from text-book.

OBSTETRICS.

ALBERT F. A. KING, A.M., M.D., LL.D.....	<i>Dean Emeritus, Professor of Obstetrics.</i>
JULIAN M. CABELL, M.D.....	<i>Assistant Professor of Obstetrics</i>
EDWARD E. MORSE, M.D.....	<i>Assistant Professor of Obstetrics</i>
H. S. MEDFORD, M.D.....	<i>Instructor in Obstetrics</i>

The course in Obstetrics comprises a series of lectures on the science and art of midwifery, and is given in the third year. The chief purpose of the lecturer is to arrange, simplify, and explain the matters studied in the text-books so as to render them more easily intelligible and to indicate their relative importance. The lectures are illustrated by diagrams, models, manikins, natural preparations, and instruments. The class is divided into sections, and each student performs various obstetrical operations upon the manikin and receives practical instruction in external pelvimetry and the methods of abdominal palpation and auscultation during pregnancy. Recitations from text-books are held throughout the term. In the fourth year clinical instruction in obstetrics is given, the class being divided into small sections and each section being required to attend a stated number of cases.

Text-book: King's Manual of Obstetrics.

Collateral reading: Hirst's Obstetrics, Williams' Obstetrics, Jewett's Practice of Obstetrics.

THEORY AND PRACTICE OF MEDICINE.

STERLING RUFFIN, M.D.....	<i>Professor of Theory and Practice</i>
L. H. REICHELDERFER, M.D.....	<i>Instructor in Medicine</i>
H. C. MACATEE, M.D.....	<i>Instructor in Medicine</i>
C. M. BEALL, M.D.....	<i>Instructor in Physical Diagnosis</i>
H. C. COBURN, M.D.....	<i>Instructor in Physical Diagnosis</i>

The method of instruction employed in this subject is as follows:

(1) Lectures with weekly recitations. (2) Clinical lectures at the

University Hospital, with practical instructions in the art of diagnosis and methods of taking and recording the history of medical cases. (3) Laboratory instruction in the use of instruments of research for the clinical study of sputum, blood, feces, etc. (4) A course of lectures to the class in physical diagnosis.

Text-books and works of reference: Osler's Practice of Medicine, Tyson's Practice of Medicine, Anders' Practice of Medicine, Sahlinger and Kalteyer's Modern Medicine, Hare's Practical Diagnosis, Musser's Clinical Diagnosis, Simon's Clinical Diagnosis, Klemperer's Clinical Diagnosis, Cabot's Clinical Examination of the Blood.

CLINICAL MEDICINE

GEO. N. ACKER, A.M., M.D.	.....	<i>Professor of Clinical Medicine</i>
G. WYTHE COOK, M.D.	.....	<i>Professor of Clinical Medicine</i>
THOS. A. CLAYTOR, M.D.	.....	<i>Professor of Clinical Medicine</i>
STERLING RUFFIN, M.D.	.....	<i>Professor of Clinical Medicine</i>
JOHN H. LINDSEY, M.D.	.....	<i>Assistant Clinical Professor of Medicine</i>
H. C. MACATEE, M.D.	.....	<i>Clinical Instructor in Medicine</i>

Clinical Medicine is taught during the third and fourth years. Instruction is given by means of clinical lectures, ward classes, actual bedside work by the students, and conferences at which the cases studied are thoroughly discussed.

The work for the third and fourth years is graded and distinct.

Third year: The class is divided into sections, and weekly each section receives instruction in clinical diagnosis. An amphitheater clinic is given weekly, at which methods of diagnosis and treatment are presented and the use of instruments of precision illustrated and explained.

Fourth year: The class is divided into sections of two students each. These sections, under the direction of instructors, are held responsible for the conduct of the cases assigned them. They are required to obtain the histories, make the physical examination, determine the diagnosis, and institute the treatment; they also make the necessary clinical laboratory examinations.

Weekly conferences are held, at which the cases studied by the sections are presented and discussed under the supervision of the clinical teachers.

Amphitheater clinics are given, at which interesting or unusual cases are presented and explained by the clinical professors.

The clinical instruction is also supplemented by the study and discussion of case histories.

GYNECOLOGY.

J. WESLEY BOVEE, M.D.....	<i>Professor of Gynecology</i>
G. BROWN MILLER, M.D.....	<i>Instructor in Gynecology</i>
A. L. STAVELEY, M.D.....	<i>Professor of Clinical Gynecology</i>
W. A. FRANKLAND, M.D.....	<i>Instructor in Clinical Gynecology</i>
A. BARNES HOOE, M.D.....	<i>Instructor in Gynecology</i>

The subject of Gynecology is taught in the third year in a course of lectures and text-book recitations. In the fourth year the class is taken in sections of one to two students each into the Gynecological Dispensaries for clinical instruction in examinations, diagnosis, and treatment. In larger sections the class attends amphitheater clinics given by the Professors of Gynecology and Clinical Gynecology.

Text-books: Bovee's Practice of Gynecology, Hirst's Diseases of Women.

Collateral reading: Dudley's Gynecology, Penrose's Diseases of Women, Montgomery's Text-book of Gynecology.

NERVOUS DISEASES.

CHARLES H. CLARK, M.D.....	<i>Professor of Nervous Diseases</i>
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Lectures and clinics are given upon the more common and important nervous affections. This course is given in the fourth year.

Text-book: Oppenheim's Nervous Diseases.

LARYNGOLOGY AND OTOTOLOGY.

CHARLES W. RICHARDSON, M.D. .	<i>Professor of Laryngology and Otology</i>
O. A. M. McKIMMIE, M.D.....	<i>Clinical Instructor in Laryngology and Otology</i>
H. S. DYE, M.D.....	<i>Clinical Instructor in Laryngology and Otology</i>

This course, given in the fourth year, comprises lectures and clinical instruction on diseases of the nasal passages, pharynx, larynx, and also the ear. Practical demonstrations are given in the use of the laryngoscope and other instruments required in these special branches.

Text-books: Kyle's Diseases of the Nose and Throat, Dench's Diseases of the Ear.

OPHTHALMOLOGY.

W. K. BUTLER, M.D.....	<i>Professor of Ophthalmology</i>
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A course of lectures on this subject is given in the fourth year. The chief object is to direct attention to the elementary principles of the subject. It is not intended to qualify the student as a specialist. The course is supplemented by clinical instruction.

Text-book: May's Diseases of the Eye.

DERMATOLOGY.

H. C. YARROW, M.D. *Professor of Dermatology*
 R. B. CARMICHAEL, M.D. *Clinical Professor of Dermatology*

The lectures on this subject are illustrated by diagrams, models, photographic illustrations of disease from life, and also by the exhibition of cases. In connection with the course clinical instruction is given. This subject is taught in the fourth year.

Text-book: Jackson's Diseases of the Skin.

MENTAL DISEASES.

WILLIAM A. WHITE, M.D. *Professor of Mental Diseases*

A series of lectures and clinics is given upon the subject of insanity in its varied forms. This course is given in the fourth year.

Text-book: Kraepelin's Clinical Psychiatry.

Collateral reading: Paton's Psychiatry.

MEDICAL JURISPRUDENCE.

W. C. WOODWARD, M.D. *Professor of Medical Jurisprudence*

This course is given in the third year, and is designed to familiarize students with the rights and obligations of physicians, both legal and ethical, and to qualify them to apply the facts of medical science to the solution of problems in law.

Text-book: Reese's Medical Jurisprudence and Toxicology.

PEDIATRICS.

GEORGE N. ACKER, A.M., M.D. *Professor of Pediatrics*
 EDGAR P. COPELAND. *Instructor in Pediatrics*

In the fourth year didactic and clinical lectures are given upon diseases of infants and children and the importance of the proper management of these diseases by diet and hygiene.

Text-book: Holt's Diseases of Infants and Children.

MORBID ANATOMY.

I. W. BLACKBURN, M.D. *Professor of Morbid Anatomy*

The instruction in this course will be mainly practical, consisting of post-mortem examinations, demonstrations, and illustrative lectures pertaining to the subjects of morbid anatomy and special pathology. Especial attention will be paid to the study of the gross pathology of

diseases of the brain and nervous system. Instruction in the technique of post-mortem examinations for scientific purposes and in medico-legal cases will be a feature of the course. This course will be given during the fourth year.

EXAMINATIONS.

Examinations are held at the end of the course in each subject. Students failing in examination will be permitted to be re-examined at the next regular examination period. Students failing in re-examination in a major subject must repeat the subjects in which they do not attain a grade of 80 or more. Students failing to appear at the regular examinations will not be examined until the next regular examination, except by special permission of the Faculty, and in this event an extra fee of \$5.00 will be charged. Students failing to pass satisfactorily their practical laboratory examinations will be required to repeat the laboratory courses and pay the regular laboratory fees. Students will not be admitted to examination unless they have paid all fees due at the time or present a permit signed by the Treasurer. In order to avail themselves of the privilege of re-examination students must file their applications with the Dean not later than fifteen days before the date set for the examinations.

In addition to the foregoing examinations students are required: to dissect satisfactorily one lateral half of the cadaver; to report satisfactorily an analysis of a specimen of urine and a clinical examination of a specimen of blood; to examine and report upon six clinical cases in general medicine and two cases in surgery; to perform satisfactorily two major surgical operations upon the cadaver; to work not less than two weeks in the Dispensary Service of the University or other hospitals; to work not less than two weeks in the Clinical Laboratory of the University or of some other hospital approved by the Dean; to take charge of one or more obstetrical cases and to report thereon; to examine and report on one case in either ophthalmology, laryngology, otology, dermatology, or orthopedics; to report upon one case in gynecology.

Proficiency is marked upon a scale of 100. A grade of 70 is required to pass an examination.

Students do not receive their numerical grades, but are notified that they have attained grades A, B, C, D, E, or F, as the case may be. A signifies 96 to 100; B signifies 90 to 95; C signifies 80 to 89; D signifies 70 to 79; E signifies failure; F signifies failure to appear for examination.

REQUIREMENTS FOR DEGREES.

Every candidate for the degree of Doctor of Medicine must be at least twenty-one years of age and of reputable character. He must have complied with the admission examination and other requirements herein set forth. He must file with the Dean, at least 30 days before the dates fixed for conferring of degrees, a notice of his intention to appear for graduation, and he must be present at the time specified for examination, and also at Commencement or Convocation. The degree is not conferred in the absence of a candidate except by special consent of the President's Council. Graduates of other accredited colleges must spend one year in residence at this school.

To be eligible for graduation the candidate must pass all his examinations.

Candidates who in their work and examinations attain general averages of 80 or more will be presented to the Faculty for consideration with reference to being designated as "having graduated with distinction." If in the opinion of the Faculty such candidates have shown themselves to be possessed of more than ordinary merit, they will have inscribed upon their diplomas beneath their degree the words "with distinction," and the names of such graduates will be distinctively printed at the head of the list of graduates of the year.

Candidates who have completed their courses, but have not passed their final examinations, may take the fall or the winter re-examinations upon payment of a fee of \$10, and, if successful, receive their diplomas at the Fall or Winter Convocation, as the case may be, upon the payment of the diploma fee.

A student who has failed of graduation after repeating his final year will not be permitted to maintain his connection with the school.

COURSES IN ARTS AND SCIENCES.

Students taking a full course for the degree of Doctor of Medicine may, if otherwise qualified, be admitted without additional fee, except laboratory fees, to courses in the Department of Arts and Sciences, provided such courses do not exceed in the aggregate six hours a week.

SCHOLARSHIPS.

Applications for scholarships should be filed with the Registrar of the University not later than September 15. Students holding scholarships pay the matriculation, library, laboratory, and graduation fees, and make the deposit to cover breakage. Holders of scholarships must also maintain a satisfactory scholastic average.

CORCORAN SCHOLARSHIPS.—In recognition of the liberality of the late W. W. Corcoran, the University has established in this department six free scholarships.

Two of these scholarships are open for competitive examination to the graduates of the several high schools and the manual training school of the District of Columbia. These two scholarships are awarded to the two students whose averages are highest.

Two of the scholarships are open for competitive examination to graduates of any reputable high school or college who shall give satisfactory written evidence of pecuniary inability and certificates of good moral character and industry. These two scholarships are awarded to the two graduates whose averages are highest.

The remaining two scholarships are open for competitive examination to students who, though not graduates of any high school or college, give satisfactory evidence that they are fitted by previous education for the study of medicine, and at the same time give satisfactory written evidence of pecuniary inability and certificates of good moral character and industry. These two scholarships are awarded to the two students whose averages are highest.

In establishing these averages professional aptitude and general qualifications are considered along with scholastic ability.

MEDICAL MISSIONARY SCHOLARSHIPS.—Two Medical Missionary Scholarships will be given to such applicants as are judged by the President of the University best qualified to enter upon the study of medicine for the purpose of becoming medical missionaries. These scholarships are awarded for one year only, but they may be renewed.

PRIZES.

A general examination prize of \$50 is annually awarded to the candidate for graduation who attains the highest average grade in all subjects.

Professor H. C. YARROW gives a prize for the best examination in Dermatology.

Professor CHARLES W. RICHARDSON gives a prize for the best examination in Laryngology and Otology.

Professor ACKER gives a prize for the best examination in Pediatrics.

Professor BUTLER gives a prize for the best examination in Ophthalmology.

HOSPITAL APPOINTMENTS.

Three interns are annually appointed in the University Hospital. They are appointed from graduates who have served as externs. Seven externs are also appointed from graduates and from the fourth-year

class. In making these appointments scholastic standing and general efficiency and aptitude are considered. Appointments to similar positions are open to the graduates and undergraduates of this school in the following other hospitals of the city: Garfield Memorial Hospital, Emergency Hospital, Columbia Hospital for Women, Casualty Hospital, Providence Hospital, Washington Asylum Hospital, Children's Hospital, Episcopal Eye, Ear, Throat, and Nose Hospital.

CLINICAL FACILITIES.

The following hospitals are open to the students of this school for clinical study.

University Hospital.—This hospital is a part of the educational equipment of this University, and is intended to be used primarily in instructing the students in clinical medicine, surgery, and obstetrics. It has also in connection with it an out-patient or dispensary service in all departments.

GARFIELD MEMORIAL HOSPITAL.—This institution has 118 charity beds. Clinics are given regularly throughout the session by members of the Faculty connected with the visiting staff of the hospital. There is also an out-patient department, giving good opportunities for experience in the practice of physical diagnosis.

CHILDREN'S HOSPITAL.—Regular clinical instruction is given in the medical and surgical wards by members of the Faculty on the visiting staff of the hospital. This institution has 100 charity beds. There is also a large out-patient department.

EMERGENCY HOSPITAL AND CENTRAL DISPENSARY.—This hospital has 36 charity beds, and has a very large out-patient service. The large emergency service gives exceptional facilities in clinical surgery. Several members of the Faculty are on its visiting and dispensary staffs and give clinical instruction to the students.

COLUMBIA HOSPITAL FOR WOMEN.—This hospital has 68 charity beds for diseases peculiar to women and 50 charity maternity beds. Members of the Faculty are connected with its service and use its facilities for clinical instruction.

PROVIDENCE HOSPITAL.—This institution has a large charity service—100 beds for medical and surgical cases and 30 maternity beds.

THE GOVERNMENT HOSPITAL FOR THE INSANE.—This hospital is maintained by the United States Government. It has 2,500 beds. Clinical instruction in mental diseases is given by the superintendent of the hospital, who is a member of the Faculty of this school.

EPISCOPAL EYE, EAR, THROAT, AND NOSE HOSPITAL.—Excellent opportunities for clinical instruction in ophthalmology, otology, laryngology, and rhinology are offered by this hospital. Members of the Faculty are on its staff.

LUTHERAN EYE AND EAR DISPENSARY.—This dispensary affords good opportunities for clinical study of diseases of the eye, ear, throat, and nose. Clinical instruction is given by a member of the Faculty.

CASUALTY HOSPITAL.—Opportunities in emergency and dispensary work are afforded by this institution.

LOCATION OF HOSPITALS.

UNIVERSITY HOSPITAL, H street between Thirteenth and Fourteenth streets, northwest, and adjacent to the Medical Building. Visiting staff: Members of the Faculty of the Department of Medicine.

Garfield Memorial Hospital, Florida avenue and Tenth street, northwest. Members of the Faculty on the visiting staff:

Professor CLAYTOR, Clinical Medicine; Professor COOK, Clinical Medicine; Professors VAN RENSSELAER and SNYDER, Clinical Surgery; Professor STAVELEY, Clinical Gynecology; Professor CARMICHAEL, Clinical Dermatology; Professor BUTLER, Clinical Ophthalmology; Professor HAGNER, Clinical Genito-Urinary Surgery.

Children's Hospital, W street between Twelfth and Thirteenth streets, northwest. Members of the Faculty on the visiting staff:

Professor WELLINGTON, Clinical Surgery; Professor ACKER, Clinical Medicine.

Emergency Hospital and Central Dispensary, Fifteenth street and Ohio avenue, northwest. Members of the Faculty on the visiting staff:

Professor CARR, Clinical Surgery; Professor HAGNER, Clinical Genito-Urinary Diseases; Dr. MACATEE, Clinical Medicine; Professor CARMICHAEL, Clinical Dermatology; Dr. MILLER, Clinical Gynecology; Professor SHANDS, Orthopedics.

Columbia Hospital for Women, Twenty-fifth street and Pennsylvania avenue, northwest. Members of the Faculty on the visiting staff:

Professor BOVEE, Clinical Gynecology; Professor CABELL and Professor MORSE, Clinical Obstetrics.

Providence Hospital, Second and D streets, southeast. Members of the Faculty on the visiting staff:

Professor BOVEE, Clinical Gynecology; Professor RICHARDSON, Clinical Laryngology and Otology; Professor SHUTE, Clinical Ophthalmology.

Episcopal Eye, Ear, Throat, and Nose Hospital, Fifteenth street between L and M streets, northwest. Members of the Faculty on the visiting staff:

Professor RICHARDSON, Clinical Otology and Laryngology; Dr. McKIMMIE and Dr. DYE, Clinical Otology and Laryngology.

Lutheran Dispensary, Fourteenth and N streets, northwest. Member of the Faculty on the visiting staff:

Professor BUTLER, Clinical Ophthalmology.

Government Hospital for Insane, Anacostia, D. C. Members of the Faculty on the visiting staff:

Professor WHITE, Mental Diseases; Professor CLARK, Nervous Diseases.

Casualty Hospital, Massachusetts avenue, northeast. Members of the Faculty on the visiting staff:

Professor WELLINGTON, Clinical Surgery; Dr. FRANKLAND, Clinical Gynecology; Dr. NOBLE P. BARNES, Clinical Medicine.

LABORATORIES.

The different laboratories of the Department are all modern and equipped with the necessary apparatus for thorough work.

PATHOLOGICAL MUSEUM.

A great many valuable and interesting specimens are contained in the Pathological Museum of this school. Their number is increased by additions from time to time. These specimens are particularly valuable to the students as illustrating the changes produced by disease.

OTHER MUSEUMS.

The Army Medical Museum affords an unrivaled opportunity for studying the conditions met with in military surgery. It contains on exhibition a collection of anatomical and pathological specimens unequaled by any other museum. Other Government museums are the Museum of Hygiene, in connection with the Medical Department of the Navy. The National Museum contains the most complete and best arranged collection of materia medica in the world. The drugs are shown in all their processes of manufacture. The Botanic Gardens, the Smithsonian Institution, the Fish Commission, the Department of Agriculture all afford opportunities for study both in medicine and its collateral sciences.

THE UNIVERSITY MEDICAL LIBRARY.

The Medical Library is open for study and consultation from 9 a. m. to 10.30 p. m. It contains at present more than 1,400 volumes, and provision is made in the annual library fee charged every student to add to it as published the important new works on medicine. As the library stands at present, it is an excellent working collection for the medical student.

OTHER LIBRARIES.

Washington contains the Library of the Surgeon General's office of the United States Army, the most complete medical library in the world. This library, as all other libraries of the Government, is open to the public between the hours of 9 a. m. and 4.30 p. m. There is also the Library of Congress and the many excellent libraries of the various other Government offices.

FEES AND CONTINGENT EXPENSES.

1. Matriculation fee (payable only on first entry into the University)	\$5
2. Library fee per annum	2
3. Tuition fee per annum, including all charges for materials.....	150
4. Fee for graduation	10

A deposit of \$5 per annum is required of every student to cover loss, breakage, or damage to the property of the school. The amount of such deposit paid in excess of the breakage will be returned.

5. Tuition fees per annum for special courses are noted on page 121, paragraph 6.	
6. Tuition fee per annum for any year repeated once, or for a fifth year	75

In addition to the tuition fees for special or repeated laboratory courses, a charge will be made for materials used.

7. Fee for a certificate under the seal of the University.....	2
8. Auditors are admitted to lecture courses for the regular tuition fees, but are not permitted to take active part in the work of the classes, and will not be allowed credit in a subsequent course of studies leading to a degree, for attendance as auditors. No matriculation or library fee is charged.	

No change will be made in the fees fixed at registration except in case of withdrawal, and then only upon notice in due form, and from the end of the current quarter session, when such withdrawal shall be approved. Applications for the granting of a withdrawal should be

made on the prescribed form to be obtained from the Registrar, and will be received only at the end of a quarter session.

Students are urged to purchase their own microscopes, but those who do not care to do so may rent them from the University at the following rates:

Microscope for Histological Laboratory use.....	\$3
Microscope for Bacteriological, Pathological, and Clinical Micro- scopy Laboratory use	5

PAYMENT OF FEES.

All fees are to be paid to the Treasurer. Tuition fees are payable quarterly, in advance. Matriculation, library, and laboratory fees are payable in full, in advance.

BOARD AND ROOMS.

A register of approved boarding houses is kept by the Treasurer. Accommodations cost from \$25 to \$40 a month.

THE REGISTRAR,
The George Washington University,
Washington, D. C.

II. DEPARTMENT OF DENTISTRY.

FACULTY.

CHARLES WILLIS NEEDHAM, LL.D.	PRESIDENT OF THE UNIVERSITY
J. HALL LEWIS, D.D.S.	Dean and Professor of Prosthetic Dentistry
HENRY C. THOMPSON, D.D.S.	Professor of Operative Dentistry
D. KERFOOT SHUTE, A.B., M.D.	Professor of Anatomy
CHARLES E. MUNROE, Ph.D.	Professor of Chemistry
THOMAS A. CLAYTOR, M.D.	Professor of Materia Medica and Therapeutics
JONATHAN R. HAGAN, D.D.S.	Professor of Oral Surgery
JOHN B. NICHOLS, M.D.	Professor of Histology
JAMES CARROLL, M.D.	Professor of Bacteriology and Pathology
J. ROLAND WALTON, D.D.S.	Professor of Prosthetic Technics
J. H. P. BENSON, D.D.S.	Professor of Operative Technics
E. G. SEIBERT, M.D.	Assistant Professor of Chemistry
W. F. R. PHILLIPS, M.D.	Assistant Professor of Practical Anatomy
WILLIAM H. TRAIL, D.D.S.	Assistant Professor of Materia Medica
D. WEBSTER PRENTISS, M.D.	Assistant Professor of Histology
L. H. TAYLOR, M.D.	Assistant Professor of Histology
NOBLE P. BARNES, M.D.	Lecturer on Materia Medica
S. H. GREENE, JR., M.D.	Instructor in Anatomy
J. L. RIGGLES, M.D.	Instructor in Anatomy
OTIS D. SWETT, B.S.	Instructor in Chemistry
FREDERICK I. BARTLETT, D.D.S.	Instructor in Crown and Bridge Work and in Prosthetic Technics
HOWARD P. COBEY, D.D.S.	Instructor in Porcelain Work
ARTHUR B. COOPER, D.D.S.	Instructor in Porcelain Work
HARRY H. DONNALLY, M.D.	Assistant Instructor in Bacteriology
CHARLES BASSETT, D.D.S.	Assistant Professor in Charge of the Dental Infirmary
HURON W. LAWSON, M.D.	Assistant Demonstrator of Anatomy
GEORGE B. HEINECKE, M.D.	Assistant Demonstrator of Anatomy
EDWARD ELLIOTT RICHARDSON, M.S., M.D.	Assistant Demonstrator of Anatomy
W. A. FRANKLAND, M.D.	Assistant Demonstrator of Anatomy
ELMER SLAYTON NEWTON, B.A., M.D.	Assistant in Chemistry
HENRY M. JEWETT, M.D.	Assistant Instructor in Histology
CHARLES L. BOVEE, D.D.S.	Demonstrator in the Dental Infirmary
CADMUS LINDEN ODOR, D.D.S.	Demonstrator of Operative Technics

JOSEPH WOOD POLLOCK, D.D.S.	Assistant Demonstrator in the Infirmary
ARTHUR MILLARD TRIVETT, D.D.S.	Assistant Demonstrator in the Infirmary
THOMAS R. WILKERSON, D.D.S.	Assistant Demonstrator in the Infirmary
M. E. HARRISON, D.D.S.	Assistant Demonstrator in the Infirmary

GENERAL STATEMENT.

The first course of lectures in the Dental School began November, 1887, under the title of "The Columbian University Dental Department." The course then extended over two years of five months each. Two years later the course was extended to seven months; but, this additional time being found inadequate to keep pace with the ever-increasing demand for higher dental education, the course was gradually increased, until now it extends over three years of eight months each.

The academic year begins on the last Wednesday in September and ends on the first Wednesday in June. The next session will begin September 25, 1907. Students should register promptly at the office of the Registrar at the beginning of the session, and no student can be received and credited with a full term after ten days from the first lecture. Final examinations are held at the conclusion of the instruction in each subject. The degrees are conferred at Commencement, the first Wednesday in June, the Fall Convocation, and at the Winter Convocation, February 22. For further information communicate with the Dean of the Dental Department or the Registrar of the University.

ADMISSION.

Candidates for matriculation must show that they are fitted by previous education to study dentistry. For this purpose they must present a satisfactory certificate of their attainments from an approved school or college, or they must pass an examination.

Candidates are admitted without examination:

- (1) Upon presenting a diploma or certificate of a reputable college conferring on them the degree of A.B. or B.S., or an equivalent degree in the arts and sciences.
- (2) Upon presenting a diploma or certificate of graduation from a high school, academy, or preparatory school approved by the University as maintaining an adequate standard.
- (3) Upon presenting a certificate of admission to the Freshman class of an approved college.

(4) Upon presenting a certificate of admission to another dental school approved by the University as maintaining an adequate standard.

Candidates unable to comply with the foregoing requirements are admitted upon passing an examination based upon the general requirement for admission to colleges, which is a four-year high school course, or its equivalent, modified to meet the regulations of State Dental Boards. This examination comprises subjects selected from the annexed list equal to 15 units. For admission to the regular course in Dentistry eight (8) of the 15 units are required in the following subjects.

	Units.
English	3
Mathematics	3
Physics	1
Latin	1
Total	8

The other 7 units may be selected from the other subjects. A unit is considered the equivalent of one year's high school work in a subject.

LIST OF SUBJECTS.

English:

	Units.
(a) Grammar	1
(b) Rhetoric and Composition	1
(c) Literature—a knowledge of the form, subject-matter, and literary history of prescribed works is required	1

The following are the works prescribed for 1906-07: Burke's Speech on Conciliation, Macaulay's Essay on Addison, Macaulay's Essay on Milton, Milton's *L'Allegro*, *Il Penseroso*, *Comus*, and *Lycidas*; Shakespeare's *Macbeth*. Equivalent reading may be offered.

Latin:

	Units.
(a) Elementary Grammar	1
(b) Cæsar's Commentaries, Books I-IV.....	1

Greek:

(a) Elementary Grammar	1
(b) Xenophon or Homer	1

Modern Languages:

	Units.
(a) French, translation of easy prose.....	1
(b) German, translation of easy prose.....	1

History:

United States	1
English	1
Greek and Roman	1
General	1

Mathematics:

(a) Algebra through quadratics	1½
(b) Plane Geometry	1
(c) Plane Trigonometry	½

Sciences:

Physics	1
Chemistry	1
Astronomy	½
Biology	1
Geology	½
Botany	1
Physical Geography	½
Physiology	½

The scope of the different subjects is indicated in standard high school text-books.

Candidates may offer other subjects than those stated in the foregoing list of subjects, and if they are acceptable examinations will be arranged. A candidate may offer certificates of an approved school for work done in any of the foregoing subjects, and will be credited with the units represented by such work. A candidate failing to pass in two of the subjects of his examination may be admitted to the first year upon the condition that he make up the deficiency before entering the second-year class. The examinations are conducted by examiners appointed by the Superintendent of Schools of the District of Columbia.

The examinations for admission will be held in June and September, at the Dental Department. An applicant deficient in either Latin or Physics, or both, may be admitted to the first-year class conditioned in those subjects, but such conditions must be made up during the first year.

COURSE OF INSTRUCTION.

The course of instruction extends through three years of eight months each. The subjects taught during the course are divided as follows:

First year.	Second year.	Third year.
Anatomy.	Operative Dentistry.	Operative Dentistry.
Physiology.	Prosthetic Dentistry.	Prosthetic Dentistry.
Chemistry.	Pathology.	Oral Surgery.
Histology.	Materia Medica.	Orthodontia Technics.
Operative Technics.	Therapeutics.	Operative Technics.
Prosthetic Technics.	Operative Technics.	Prosthetic Technics.
	Prosthetic Technics.	Infirmity Practice.
	Infirmity Practice.	Dental Therapeutics.
	Bacteriology.	

These studies are further described in the following pages.

PROSTHETIC DENTISTRY AND METALLURGY.

J. HALL LEWIS, D.D.S.....*Professor*

In this subject the principles involved in the construction of artificial substitutes are exhaustively considered and the lectures supplemented by practical demonstrations of the subjects mentioned. In addition to the more commonly used vegetable bases for artificial teeth, the use of gold, silver, and platinum is thoroughly taught, and bridge work and the construction of appliances for correcting oral irregularities, etc., are carefully considered. The modes of preparation, properties, etc., of the metals and alloys of particular interest to the dentist receive special attention.

The instruction is thoroughly practical, with the purpose of preparing the student for the actual every-day practice of prosthetic dentistry.

OPERATIVE DENTISTRY, DENTAL ANATOMY AND PATHOLOGY.HENRY C. THOMPSON, D.D.S.....*Professor*

This course embraces lectures on the special anatomy and physiology of the teeth. The origin, growth, and eruption of the teeth receive minute attention, and are illustrated as their importance demands.

The methods of treating, filling, and extracting teeth receive attention in the lecture-room, and are demonstrated clinically by proficient operators. Extended consideration is given to dental pathology and therapeutics.

CHEMISTRY.CHARLES E. MUNROE, Ph.D.....*Professor*E. G. SEIDERT, M.D.....*Assistant Professor*OTIS D. SWETT, B.S.....*Instructor*ELMER S. NEWTON, B.A., M.D.....*Assistant*ARTHUR N. TASKER, B.A.....*Assistant*

The instruction in this subject embraces:

A short discussion of the principles of Physics in their relation to Chemistry, the principles of chemical philosophy, and the laws of chemical combination.

A study of the elements, metallic and non-metallic; the preparation, properties, and reaction of their different compounds and their application in dentistry; Organic Chemistry, with special attention to those organic compounds that are of practical use; laboratory instruction in the determination of acids and bases, analyses of alloys, etc.

PHYSIOLOGY.W. P. CARR, M.D.....*Professor*L. H. TAYLOR, M.D.....*Assistant Professor*

The subject is fully covered the first year by a course of lectures, and these lectures are so illustrated by modern diagrams, models, and experiments as to make them clear in detail. Emphasis is given to principles that have a known practical value.

MATERIA MEDICA AND THERAPEUTICS.THOMAS A. CLAYTOR, M.D.....*Professor*WM. H. TRAIL, D.D.S.....*Assistant Professor*NOBLE P. BARNES, M.D.....*Lecturer on Materia Medica*

Instruction in this subject extends through the first two years, and embraces:

The study of crude drugs and their preparations and the art of pre-

scribing; the physiological action of drugs in the human system; the practical application of drugs and other therapeutical agencies to the prevention and cure of diseases and the relief of suffering, together with their antidotal relation to poisons.

The subject is taught by means of lectures, recitations, and blackboard illustrations, and is made practical to as great a degree as is compatible with a sufficiently thorough understanding of its principles.

In connection with this chair is a pharmaceutical laboratory, well equipped with modern appliances, in which are taught the making of typical preparations of the Pharmacopœia, prescription writing, and the compounding of prescriptions.

ANATOMY.

D. KERFOOT SHUTE, A.B., M.D.....	<i>Professor</i>
W. F. R. PHILLIPS, M.D.....	<i>Assistant Professor</i>
GEO. B. HEINECKE, M.D.....	<i>Assistant Demonstrator</i>
VIRGIL B. JACKSON, M.D.....	<i>Assistant Demonstrator</i>
E. E. RICHARDSON, M.D., M.S.....	<i>Assistant Demonstrator</i>
W. A. FRANKLAND, M.D.....	<i>Assistant Demonstrator</i>
S. H. GREENE, JR., M.D.....	<i>Instructor</i>
J. L. RIGGLES, M.D.....	<i>Instructor</i>
R. M. LITTLE, M.D.....	<i>Assistant Demonstrator</i>
GEO. M. RUFFIN, M.D.....	<i>Instructor</i>
JOS. D. RODGERS, M.D.....	<i>Assistant Demonstrator</i>

The instruction in Anatomy is given in a graded course of lectures, recitations from prescribed text-books, and especially by practical work in the dissection of the cadaver. The lectures are illustrated by the use of dry and wet dissections of the cadaver, by models, diagrams, charts, and sciopticon views.

Practical work in osteology and in dissection of the head are of fundamental importance. For the study of these subjects the class is divided into sections in order to make the instruction as practical as possible. The bones of the skeleton are placed in each student's hands, and he is instructed and quizzed upon all their important features.

ORAL SURGERY.

J. R. HAGAN, D.D.S.....	<i>Professor</i>
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This subject includes lectures on general surgery, surgical bacteriology, inflammations, abscess, gangrene and necrosis, the reduction of luxations and fractures and all the latest appliances for their proper retention; diagnosis and treatment of the maxillary sinus, plastic operations for correction of cleft palate and hare lip, treatment of wounds,

shock and collapse; also the origin, classification, growth, and removal of tumors of the face, mouth, and jaw.

HISTOLOGY.

JOHN B. NICHOLS, M.D.....	<i>Professor</i>
D. WEBSTER PRENTISS, M.D.....	<i>Assistant Professor</i>
HENRY M. JEWETT, M.D.....	<i>Assistant Instructor</i>
C. L. DAVIS, M.D.....	<i>Assistant Instructor</i>

The course in Histology consists in a systematic presentation of the subject of the minute anatomy of the various parts of the body, especial attention being devoted to the histology of the teeth and neighboring structures. The subject is presented partly by systematic lectures, and more especially by the practical study by the individual students of actual specimens under the microscope. The methods of preparation of microscopical specimens are presented and practiced in the laboratory. The projection microscope affording valuable aid in illustrating and presenting the subject, is constantly used.

BACTERIOLOGY.

JAMES CARROLL, M.D.....	<i>Professor</i>
HARRY H. DONNALLY, M.D.....	<i>Assistant Instructor</i>

The course begins with a consideration of the principles involved in the process of sterilization by dry and moist heat, the relative value and mode of application of each, and an explanation of the construction of the apparatus employed for the purpose. The use and construction of the thermostat is taken up at the same time and the student taught how he can dispense with these costly appliances in emergencies.

The composition and modes of preparation of the various nutritive media are next considered, working formulas given, and the student required to prepare them at least once in the laboratory. This is followed by a discussion of bacteria as a class, their position in the biological world, their classification, distribution, and the general and special characters that belong to them.

After this preparatory training the various methods in use for the isolation and study of bacteria are taught by practical demonstration and practiced by the students, after which the most important pyrogenic organisms are studied in detail, giving special attention to those found in the nasal and oral cavities.

The aim of the course is chiefly to afford the students an opportunity to become practically familiar with bacteriological working methods, and to enable them to isolate and identify the bacteria present in suppurative processes, as well as to comprehend intelligently the references to micro-organisms in the current professional literature of the day.

OPERATIVE TECHNIQS.

J. H. P. BENSON, D.D.S.....*Professor*
 CADMUS L. ODOR, D.D.S.....*Assistant*

This subject is taught by lectures, illustrated by enlarged models and drawings, together with demonstrations of instruments and materials. The students perform exercises in manipulative procedure under the direction of the instructors.

The subjects embraced in the course consist, first, of the study of dental nomenclature, that the student may acquire an understanding of the technical terms used in the course of his dental studies. This is followed by **descriptive dental anatomy and the forms and surface** markings of each tooth studied, the natural teeth, as well as enlarged models and drawings, being used for the purpose. Each student is required to make various sections of the teeth for the thorough study of the pulp chambers and root canals and their relations to the external surfaces of the teeth.

That tooth-forms may be more perfectly impressed upon the mind of the students, each one is required to carve a tooth of the several classes, as incisor, cuspid, bicuspid, and molar, in bone or artificial ivory, representing the actual form and size of the natural organ. Cavities are classified and illustrated by drawings and models, followed by their preparation and filling in technic forms by the student. Treating and filling root canals is given full attention, the students performing operations of this kind upon natural teeth mounted for the purpose.

All work, in its relation to operative dentistry, is given the necessary consideration to fit the student for meeting, as far as possible the actual requirements of the infirmary. The operations in the technic department require a large number of natural teeth and a sufficient supply is difficult to obtain. It will, therefore, be to the interest of students if they will bring with them all the extracted teeth they can procure.

ORTHODONTIA.

J. ROLAND WALTON, D.D.S.....*Professor*
 CHARLES BASSETT, D.D.S.....*Instructor*

Orthodontia is taught by lectures and practical work in the Infirmary.

Junior year Orthodontia is a technical course with such lectures and demonstrations as will enable the student to perform the Infirmary work. The Senior year is a review of the Junior studies with advanced lectures upon the irregularities of the teeth, local and constitutional. Each student is required to make a number of appliances upon models and practically correct cases of irregularity.

CROWN AND BRIDGE WORK.

CHARLES L. BOVEE, D.D.S.	<i>Instructor Senior Class</i>
ALLEN S. WOLFE, D.D.S.	<i>Instructor Junior Class</i>
FREDERICK I. BARTLETT, D.D.S.	<i>Instructor Freshman Class</i>

Instruction in this course is systematically given by lectures and clinics. The course in technique extends through the Freshman, Junior, and Senior years.

PROSTHETIC TECHNICS.

CHARLES L. BOVEE, D.D.S.	<i>Instructor Senior Year</i>
ALLEN S. WOLFE, D.D.S.	<i>Instructor Junior Year</i>
FREDERICK I. BARTLETT, D.D.S.	<i>Instructor Freshman Year</i>

The technic laboratories are thoroughly equipped for their particular work. The course in prosthetic technics extends through the Freshman, Junior, and Senior years.

The first year is a technical course. The students are taught the proper equipment of a dental laboratory; the preparation of the mouth for dentures; methods of taking impressions of the mouth and manipulation of the various impression materials; the preparation and mounting of models; selection and artistic arrangement of teeth; the construction of plastic dentures with general details.

In the Junior class the course is a review of the Freshman year with extended technical work, embracing a practical course in the swaging of the various metals, as taking impressions, making models and dies, swaging, rimming, attaching teeth by rubber, and in general construction of metal dentures, crown and bridge work.

The Senior year is a practical course, embracing the swaging of plates, teeth attached by soldering, clasps, porcelain work, advanced bridge-work, removable bridges, and the detailed construction of all work in prosthetic dentistry.

PORCELAIN WORK.

ARTHUR B. COOPER, D.D.S.	<i>Instructor</i>
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Students are taught the principles and practice of inlay work, porcelain crowns, high and low fusing bodies, the use of the electric and gas furnaces.

THE DENTAL INFIRMARY.

CHARLES BASSETT, D.D.S.	<i>Demonstrator in Charge</i>
CHARLES L. BOVEE, D.D.S.	<i>Demonstrator</i>
JOSEPH WOOD POLLOCK, D.D.S.	<i>Demonstrator</i>
ARTHUR MILLARD TRIVETT, D.D.S.	<i>Demonstrator</i>
THOMAS R. WILKERSON, D.D.S.	<i>Demonstrator</i>

The Infirmary is open every week day for nine continuous months (being closed during the months of July, August, and September), during which time an abundance of clinical material is readily available. In fact, as many patients present themselves as can possibly be attended to by the students. It is under the immediate supervision of the Demonstrator in charge, who, is present from 1 until 6 o'clock each week day.

TEXT-BOOKS AND WORKS OF REFERENCE.

(The works first named and in *italics* are preferred.)

Anatomy.—*Cunningham's Text-Book of Anatomy*; *Cunningham's Manual of Practical Anatomy*; Dental Anatomy, Black's.

Physiology.—Raymond's Human Physiology.

Chemistry.—*Simon's Chemistry*.

Materia Medica.—H. C. Wood's *Therapeutics*; Hare's *Practical Therapeutics*; A. A. Stevens' *Modern Materia Medica and Therapeutics*; Culbreth's *Materia Medica and Pharmacy*; National Dispensatory.

Prosthetic Dentistry.—*The American Text-Book of Prosthetic Dentistry*; Essig's *Dental Metallurgy*.

Operative Dentistry.—*Harris' Principles of Practice*; Tome's *Dental Anatomy and Surgery*; Taft's *Operative Dentistry*; American System of Dentistry—Litch.

Oral Surgery.—Marshall's *Oral Surgery*; Grant's *Oral Surgery*.

Histology.—Nichols, Böhm and Davidoff.

Orthodontia.—Talbot, *Irregularities of the Teeth*; Angle, *Treatment of Malocclusion of the Teeth and Fractures of the Maxillæ*; Jackson, *Orthodontia*.

GRADUATION.

Candidates for graduation must have attended three full courses of lectures, each of eight months duration, and three courses of clinical instruction in this Department, during the regular winter term and in separate years. Students are examined at the end of the regular course upon all subjects taught them during that course. Should the student fail in his examination in course, he may be re-examined in the fall. All fees must be paid and Infirmary requirements complied with before the student may present himself for examination.

Students must enter before, or within ten days after, the opening lecture of the regular course. They may register at any time during the nine months Infirmary course, and thus begin Infirmary practice at once upon payment of twenty-five dollars, which amount will be deducted from their tuition fees for the succeeding regular term.

The candidate for graduation must be examined upon all subjects taught in this Department, and before the examination he must perform operations upon the natural organs in the Infirmary, and present the

Museum a well-constructed specimen of dental mechanism made by himself in the dental laboratory of the University.

In addition to the above requirements, the moral character and habits of the candidate, his industry, and diligent attendance will be taken into consideration. Notable negligence, immorality, or habitual absence from the lectures will preclude the candidate from attaining his degree, even though he may have acquired sufficient technical knowledge to pass a creditable examination. This reservation on the part of the Faculty of the right to make good moral character a prerequisite for graduation must not be overlooked.

The student also, during and between the sessions, must comply with the State laws regulating the practice of Dentistry, and act in accordance with the recognized code of ethics of the dental profession.

The degrees are conferred by The George Washington University, incorporated by Act of Congress of the United States.

PRIZES.

FACULTY PRIZE.—A prize will be given by the Faculty to the graduate passing the best examination in all branches and having the best infirmary record.

COURSES IN ARTS AND SCIENCES.

Students taking a full course for a degree may be admitted without additional fee, except laboratory fees, to courses for which they are qualified, in the Department of Arts and Sciences, the aggregate of such courses not to exceed six hours per week.

LOCATION.

The Dental Building is No. 1325 H street, N. W. It is within half a square of all lines of street cars going to every part of the city.

The Dean may be seen personally at 1121 Vermont avenue on any week day from 3 to 4 p. m., and also at the Dental Building, 1325 H street, N. W., on Tuesday, Thursday, and Saturday of each week at 4.30 p. m.

FEES AND CONTINGENT EXPENSES.

1. Matriculation fee (payable only on first entry into the University) \$5
 2. Library fee per annum 2
 3. Tuition fee per annum, including all charges for materials 150
- A deposit of \$5 per annum is required of every student to cover loss, breakage or damage to the property of the school. The amount of such deposit paid in excess of the breakage will be returned.
4. Fee for graduation 10
 5. Tuition fees per annum for special courses are noted on page 121, paragraph 6.

6. Tuition fee per annum for any year repeated once..... \$75

In addition to the tuition fees for special or repeated laboratory courses, a charge will be made for materials used.

7. Fee for a certificate under the seal of the University..... 2

8. Auditors are admitted to lecture courses for the regular tuition fees, but are not permitted to take active part in the work of the classes and will not be allowed credit, in a subsequent course of studies leading to a degree, for attendance as auditors. No matriculation or library fee is charged.

No change will be made in the fees fixed at registration except in case of withdrawal, and then only upon notice in due form and from the end of the current quarter session when such withdrawals shall be approved. Applications for the granting of a withdrawal should be made on the prescribed form, to be obtained from the Registrar, and will only be received at the end of a quarter session.

Students are urged to purchase their own microscopes, but those who do not care to do so may rent them from the University at the following rentals:

- Microscope for Histological Laboratory use..... 3
Microscope for bacteriological, pathological, and clinical microscopy laboratory use 5

PAYMENT OF FEES.

All fees are to be paid to the Assistant Treasurer. Tuition fees are payable quarterly, in advance. Matriculation, library, and laboratory fees are payable in full, in advance.

BOARD AND ROOMS.

A register of approved boarding houses is kept by the Treasurer. Accommodations cost from \$25 to \$40 a month.

For catalogues, application blanks and further information, address

THE REGISTRAR,
The George Washington University,
Washington, D. C.

Department of Law.

FACULTY.

CHARLES WILLIS NEEDHAM, LL.D.	PRESIDENT OF THE UNIVERSITY
WILLIAM REYNOLDS VANCE, Ph.D., LL.B.	Dean of the Faculty and Professor of Law
JOHN M. HARLAN, LL.D.	Professor of Law
DAVID J. BREWER, LL.D.	Professor of Law
MELVILLE CHURCH, LL.M.	Professor of the Law of Patents
WALTER C. CLEPHANE, LL.M.	Professor of Law
EDWIN C. BRANDENBURG, LL.M.	Professor of Law
ARTHUR PETER, LL.M.	Professor of Law
HENRY P. BLAIR, LL.M.	Professor of Law
STANTON J. PEELE, LL.D.	Professor of Law
JOHN PAUL EARNEST, A.M., LL.M.	Professor of Law
ERNEST G. LORENZEN, Ph.B., LL.B., J.U.D.	Professor of Law
JAMES BROWN SCOTT, M.A., J.U.D.	Professor of Law
WILLIAM CULLEN DENNIS, A.M., LL.B.	Professor of Law
EDWARD SAMPSON THURSTON, A.M., LL.B.	Assistant Professor of Law
JOSHUA REUBEN CLARK, JR., B.S., LL.B.	Assistant Professor of Law
JOHN WILMER LATIMER, LL.B.	Clerk of the Moot Court
OTIS D. SWETT, B.S., LL.M.	Secretary

COURT OF APPEALS.

WILLIAM F. MATTINGLY, LL.D.	Chief Justice
JOHN B. LARNER, LL.B.	Associate Justice
A. A. HOEHLING, JR., LL.B.	Associate Justice

GENERAL STATEMENT.

This Department, established in 1865, is the oldest school of law in the city of Washington. Its course of instruction for the degree of Bachelor of Laws, originally requiring but two years, was gradually expanded, until, in 1868, in accordance with the recommendation of the Association of American Law Schools, of which this school is one of the charter members, it was increased to three years. The Faculty has also shown a gradual increase in numbers commensurate with the expansion of the course and the growing number of students in attendance. In June, 1903, the Board of Trustees adopted the policy of putting the fundamental subjects of substantive law in charge of permanent professors, devoting their whole time and energy to the work of the Department.

In 1877 a year of graduate work, leading to the degree of Master of Laws, was added to the course of instruction offered, and in 1905 a

special graduate course of three years, leading to the degree of Doctor of Jurisprudence, was established. A special course in Patent Law was added in 1895.

In June, 1898, an ordinance was adopted by the Board of Trustees formally establishing as a separate department of the University the Department of Jurisprudence and Diplomacy. This Department was opened on November 15, 1898.

In 1904, by the authority of the Board of Trustees, a new adjustment of graduate work in the University was made, resulting in the establishment of the Departments of Law and of Politics and Diplomacy (now called the College of the Political Sciences), the former embracing the undergraduate course in municipal law and graduate courses in the broader fields of general law, and the latter graduate and undergraduate courses in the political sciences, special attention being given to diplomacy.

LOCATION.

All classes in the Department of Law are held in Law Lecture Hall, situated on H street, adjoining the main University building, at the corner of Fifteenth street. This hall, dedicated on January 3, 1899, was especially designed for the work of this Department. It is commodious and well equipped with lecture-rooms, Moot Court rooms and offices, and contains a large library, with a conference-room adjoining.

ACADEMIC YEAR.

The academic year extends through more than eight months, beginning on the last Wednesday in September and ending on the first Wednesday in June, and is divided into two half-years, the second half-year beginning on the first day of February. Since most of the courses given during the first half-year are completed before the beginning of the second half-year, it is possible for a student to enter on the 1st of February of any year and be graduated three years from that date, receiving his degree at the Winter Convocation, held on February 22d of each year.

ADMISSION.

1. FOR THE DEGREE OF BACHELOR OF LAWS.

Applicants for admission as candidates for the degree of Bachelor of Laws must be at least eighteen years of age and must have had educational training equivalent to a course in an approved high school. The educational requirement may be satisfied by presentation of certificates or by examination in the usual high school branches. All applications for admission should be addressed to the Registrar of the University, who will, upon request, furnish proper blanks and detailed information as to entrance examinations.

Admission Requirements. Beginning with the session of 1909-1910, no student will be admitted to regular standing unless he shall have successfully completed two years of undergraduate work in an approved institution of collegiate rank. Applicants who have completed a high school course may, however, at the discretion of the Faculty, be admitted as special students. Such special students may qualify for graduation by showing an average grade during the entire course exceeding the passing grade by fifteen points.

2. FOR THE DEGREE OF MASTER OF LAWS.

Candidates for the degree of Master of Laws must be at least twenty-one years of age and hold the degree of Bachelor of Laws from an institution substantially complying with the requirements of the Association of American Law Schools, of which this school is a member.

3. FOR THE DEGREE OF MASTER OF PATENT LAW.

Only those students who are graduates of an approved law school or members of the bar in good standing will be admitted as candidates for the degree of Master of Patent Law.

4. FOR THE DEGREE OF DOCTOR OF JURISPRUDENCE.

No student will be admitted as a candidate for a degree of Doctor of Jurisprudence unless he shall hold a baccalaureate degree conferred by some institution of approved standing after the completion of a liberal course of undergraduate academic study, and possess a reading knowledge of Latin, French, and German. At the discretion of the Faculty, however, other languages may be substituted when the character of the work undertaken is such as to warrant it. The right is reserved to the President's Council to decide in all cases whether the applicant has given sufficient evidence that his antecedent training fulfills these requirements. In addition, the candidate must hold the degree of Bachelor of Laws from this University or from some other institution requiring equivalent work as a prerequisite to that degree.

5. SPECIAL STUDENTS.

Persons who for any reason do not qualify as candidates for a degree may, on the recommendation of the Faculty and with the assent of the professors whose courses they elect to take, be admitted as special students. Special students may subsequently be admitted to regular standing in any of the classes upon satisfying the requirements of admission thereto.

ADVANCED STANDING.

Students may be admitted to advanced standing in the second or third year classes upon satisfying the requirements for the work of the preceding year or years. These requirements may be met by presenting certificates from other law schools of accredited standing showing that the

student has successfully completed equivalent courses, or by passing the regular examinations set for that purpose at the beginning of the term, after showing that he has pursued a course of study in the subjects upon which he is examined covering at least as many hours as are required for such subjects in this University.

Attorneys in good and regular standing who have been admitted to practice in any State requiring a written examination for admission to the bar may be admitted to advanced standing in the second or third year class, at the discretion of the Dean.

All examinations that may be required of applicants for advanced standing are held during the first week of each session.

HOURS FOR LECTURES.

During the session of 1907-08 instruction will be given to the first and second year classes during the forenoon as well as the afternoon hours, while to the third year class the lectures will as yet be given in the afternoon only. Of the instruction offered to each of the first and second year classes, aggregating more than fifteen hours per week, nine hours will be given in the afternoon between 4.50 and 6.30. A minimum of twelve hours each year, or thirty-six hours for the entire course of three years, is required for the degree of Bachelor of Laws. Therefore students who are so situated as to be able to attend only the afternoon lectures will find it possible to complete the amount of work required for the degree within four years, the subjects taught in the forenoon and afternoon, respectively, being so alternated that the afternoon student can, during his course, have the opportunity of securing instruction in all of the subjects open to undergraduates.

METHOD OF INSTRUCTION.

Instruction in the class-room is based upon the study and discussion of cases. In some of the courses students are required to read parallel assignments in text-books.

In conducting the discussion of cases in the class-room every effort is made to lead the student to a clear understanding of the fundamental legal principles that may be involved, and to afford him scientific training in accurate methods of study and of reasoning along legal lines. Students are also required to submit written briefs upon doubtful points of law, to draw up contracts, conveyances, and other papers when the nature of the subject in hand is such as to make exercises of this kind useful in giving accurate instruction.

All subjects involving the adjective law are in charge of professors who are engaged in active practice. The general principles of these subjects, taught in the same manner as indicated above, are developed by practice before the Moot Courts.

UNDERGRADUATE PROFESSIONAL COURSES.

Undergraduate students in Columbian College upon the completion of forty-five units of credit may take the first year's work of the course for Bachelor of Laws, crediting them fifteen units in the College, on the completion of which they may receive the College degree.

COURSES OF INSTRUCTION.

A. LEADING TO THE DEGREE OF BACHELOR OF LAWS.

The course of instruction leading to the degree of Bachelor of Laws extends through a period of three years. A minimum of thirty-six hours' work will be required of all students hereafter entering the Department, students already registered being permitted to qualify for their degrees upon the completion of the courses as heretofore required. These include twelve hours of work each week for the first and second year classes, and ten hours for the third year class. By means of the courses as arranged, it is intended to give to the student such sound training in the fundamental principles of English and American law as will fit him for the practice of the legal profession in any of the States or Territories of the United States.

FIRST YEAR SUBJECTS.

First Half-Year.

Contracts. Professor SCOTT. Three hours a week. Williston's Cases on Contracts.

Property. Professor VANCE. One hour a week. Gray's Cases on Property, Volume I.

Constitutional Law. Professor HARLAN. Two hours a week. Cooley's Constitutional Law and McClain's Cases on Constitutional Law.

Torts. Professor THURSTON. Three hours a week. Ames & Smith's Cases on Torts.

Domestic Relations. Professor BLAIR. Two hours a week. Long on Domestic Relations.

Criminal Law. Professor EARNEST. Three hours a week. Clark on Criminal Law and Beale's Cases on Criminal Law.

Bailments. Professor PEELE. One hour a week. Hale on Bailments.

Second Half-Year.

Contracts. Professor SCOTT. Three hours a week. Williston's Cases on Contracts.

Property. Professor VANCE. Two hours a week. Gray's Cases on Property, Volumes I and II.

Constitutional Law. Professor HARLAN. Two hours a week. Cooley's Constitutional Law and McClain's Cases on Constitutional Law.

Torts. Professor THURSTON. Two hours a week. Ames & Smith's Cases on Torts.

Criminal Procedure. Professor EARNEST. One hour a week. Clark on Criminal Procedure.

Sales. Professor BLAIR. Three hours a week. Burdick's Cases on Sales.

Agency (including Master and Servant). Professor THURSTON. Three hours a week. Wambaugh's Cases on Agency.

SECOND YEAR SUBJECTS.

First Half-Year.

Property. Professor VANCE. Two hours a week. Gray's Cases on Property, Volumes II and V.

Common Law Pleading and Practice. Professor CLEPHANE. Two hours a week. Tyler's Stephen on Pleading.

Evidence. Professor PETER. Two hours a week. McKelvey on Evidence and Thayer's Cases on Evidence.

Corporations. Professor LORENZEN. Two hours a week. Smith's Cases on Corporations.

Insurance. Professor VANCE. Three hours a week. Vance's Cases on Insurance.

Quasi Contracts. Professor THURSTON. Three hours a week. Scott's Cases on Quasi Contracts.

Second Half-Year.

Property. Professor VANCE. Two hours a week. Gray's Cases on Property, Volumes II and V.

Evidence. Professor PETER. Two hours a week. McKelvey on Evidence and Thayer's Cases on Evidence.

Bills and Notes. Professor LORENZEN. Three hours a week. Hufcut's Cases on Negotiable Instruments. [Not given in 1907-08.]

Equity Pleading. Professor CLEPHANE. One hour a week. Van Zile on Equity Pleading and Practice.

Equity. Professor DENNIS. Two hours a week. Scott's Cases on Equity.

Suretyship. Professor VANCE. Three hours a week. Ames' Cases on Suretyship.

Partnership. Professor PEELLE. One hour a week. Burdick on Partnership.

Corporations. Professor LORENZEN. Two hours a week. Smith's Cases on Corporations.

THIRD YEAR SUBJECTS.

During the session of 1907-08 third year students may select from the following courses such subjects as, together with the required work already taken, will make up the required minimum of ten hours a week. Such students are permitted, however, subject to approval of the Dean, to choose not more than two of the courses offered to the fourth year students.

Elections of courses to be taken must be made in all cases within ten days after the beginning of the semester in which such courses are given.

First Half-Year.

Moot Court. Professors CLEPHANE, EARNEST, and PETER. Two hours a week. (*Required.*)

Equity. Professor DENNIS. Two hours a week. Scott's Cases on Equity.

Property. Professor VANCE. Two hours a week. Tiffany on Real Property.

Trusts. Professor THURSTON. Two hours a week. Ames' Cases on Trusts.

Conflict of Laws. Professor LORENZEN. Two hours a week. Dwyer's Cases on Conflict of Laws.

Legal Tactics. Professor CLEPHANE. One hour a week.

International Law. Professor BREWER. One hour a week. Taylor's International Law.

Federal Procedure. Two hours a week.

Second Half-Year.

Moot Court. Professors CLEPHANE, EARNEST, and PETER. Two hours a week. (*Required.*)

Mortgages. Professor CLARK. Three hours a week. Wyman's Cases on Mortgages.

Wills and Administration. Professor PETER. One hour a week.

Municipal Corporations. Professor DENNIS. Two hours a week.

Smith's Cases on Municipal Corporations.

International Law. Professor BREWER. One hour a week. Taylor's International Law.

Conflict of Laws. Professor LORENZEN. Two hours a week. Dwyer's Cases on Conflict of Laws.

Organization and Management of Corporations. Professor CLEPHANE. One hour a week. Clephane on the Organization and Management of Corporations.

Brief-Making and Legal Bibliography. Professor BRANDENBURG. One hour a week. Text-book on Brief-Making.

B. LEADING TO THE DEGREE OF MASTER OF LAWS.

Students admitted to the fourth year as candidates for the degree of Master of Laws are required to elect courses, not previously taken, covering a minimum of ten hours a week. These may be freely elected from the subjects given below, which are considered by the Faculty especially suited to the needs of students who have already completed an undergraduate course in law. The student may, however, choose as electives two other subjects offered by the Faculty of Law which he has not taken during his undergraduate course. The practice work offered in the fourth year Moot Courts may be taken and will be counted as two hours of required work.

FOURTH YEAR SUBJECTS.

Comparative Constitutional Law. President NEEDHAM. Two hours a week. One year.

International Law. Professor SCOTT. Three hours a week. One year. Scott's Cases on International Law.

Moot Court. Professors CLEPHANE, EARNEST, and PETER. Two hours a week. One year.

Interstate Commerce Law. President NEEDHAM. Two hours a week. One year.

Civil Law I—Roman Law. Professor LORENZEN. Two hours a week. One year. Sohm's Institutes of Roman Law.*

Taxation. Professor THURSTON. Three hours a week. One-half year. Goodnow's Cases on Taxation.

Water rights. Professor VANCE. One hour a week. One-half year. Long on Irrigation.

Bankruptcy. Professor BRANDENBURG. Two hours a week. One-half year. Brandenburg on Bankruptcy.

Admiralty. Professor SCOTT. Two hours a week. One half year. Ames' Cases on Admiralty.

Extraordinary Legal Remedies. Two hours a week. One-half year. Roberts' Cases on Extraordinary Legal Remedies.

Civil Law II—Spanish-American Law. Professor LORENZEN. Three hours a week. One-half year.†

C. LEADING TO THE DEGREE OF MASTER OF PATENT LAW.

A special course in Patent Law and Patent Law Practice is given by Professor CHURCH. The purpose of this course is to prepare those

* Students electing Roman Law should possess some knowledge of Latin.

† Students electing Spanish-American Law should possess a reading knowledge of Spanish and have had previous instruction in Roman Law.

taking it for practice in all matters involving the law of patents. The course extends throughout one year, with two lectures or sessions of the Moot Court each week.

D. LEADING TO THE DEGREE OF DOCTOR OF JURISPRUDENCE.

The purpose of these courses is primarily to give to the student a more thorough and comprehensive knowledge of International Law, of the History of Law, and of Comparative Public and Private Law in order that he may attain a sounder and more philosophic understanding of the principles that underlie our own municipal law. The training and knowledge acquired in these courses will prove specially beneficial to those who desire to fit themselves for the foreign service, for the conduct of cases before international tribunals, and for the general practice in matters involving the laws of foreign countries. The method of instruction and requirements for the degree are set forth on page 177.

Subject to the approval of the Faculty, the student may select his major and minor subjects from the following courses offered:

I. ROMAN LAW:

Offered by Professor LORENZEN.

1. History and Sources of Roman Law Before the Time of Justinian.
2. The Institutes of Gaius and the *Corpus Juris* of Justinian.
3. History of the Law during the Middle Ages.
4. Seminary in Roman Law.

II. THE HISTORY OF LAW:

Offered by Professor VANCE.

1. Origin and Growth of the Common Law of England.
- Offered by Professor SCOTT.
2. Seminary in the History of Law.

III. INTERNATIONAL LAW:

Offered by Professor SCOTT.

1. International Law.
2. Seminary in International Law.

IV. CONSTITUTIONAL LAW:

Offered by Professor HARLAN.

1. Constitutional Law.
- Offered by President NEEDHAM.
2. Comparative Constitutional Law.

V. COMPARATIVE PRIVATE LAW:

Offered by Professor LORENZEN.

1. Comparative Commercial Law.
2. SpanishAmerican Law.*

ELECTIVE COURSES IN OTHER DEPARTMENTS OF THE UNIVERSITY.

Students taking a full course for a degree may be admitted, without additional fee except laboratory fees, to courses for which they are qualified in the Departments of Arts and Sciences and of Politics and Diplomacy, provided such courses do not exceed in the aggregate six hours a week.

COURSES IN PRACTICE.

A. MOOT COURT WORK.

1. *Third Year:*

Particular stress is laid upon Moot Court Work. Aside from the practice court connected with the course in Patent Law, there are four courts in which the candidates for the degree of Bachelor of Laws pursue their work. Three of these are *nisi prius* courts and are presided over by members of the Washington Bar in active practice. The fourth is a Court of Appeals to review the cases tried in the courts of first instance. This court also is composed of members of the Washington Bar.

Every third-year student before receiving the degree of Bachelor of Laws is required to prepare the pleadings in and prosecute to judgment the required number of cases in the *nisi prius* courts, with the privilege of appeal to the appellate tribunal. At least two hours in each week during the year must be spent by each third-year student in active participation in Moot Court work in the court-room to which he is assigned.

Statements of facts are furnished, such as would be related to a lawyer in active practice by his client. Each student must determine whether or not upon such facts the particular case in hand is one of common-law or equitable cognizance. He must then frame his pleadings, serve his writs, and answer his adversary's pleadings until issue is joined in legal manner, after which the case is brought on for hearing in strict accordance with the rules of actual practice. Juries are empaneled in accordance with settled legal procedure, witnesses are examined and cross-examined, and the case conducted through all the various stages of the trial or hearing down to and including the judgment or decree,

*A reading knowledge of Spanish is required.

after which, should the case be appealed, it must be carried through the appellate court, involving the preparation of the record on appeal, briefs of counsel, etc.

2. Fourth Year:

The same facilities for Moot Court work as are described above are afforded in the course leading to the degree of Master of Laws. In this course, however, the nature of the cases assigned is somewhat different, involving, in addition to the ordinary cases at common law or in equity, cases of a special character, such as habeas corpus, certiorari, quo warranto, injunction, mandamus, extradition, replevin, attachment, etc.

3. Officers and Equipment:

The clerk of the Moot Court was formerly one of the assistant clerks of the Supreme Court of the District of Columbia, but his assistants in each court-room are chosen from the student body, from whose ranks are also drawn the criers, jurors, and other officials, thus giving to the students the benefit of practice in administrative judicial machinery. The Moot Court is to all intents and purposes an actual court. The rooms in which the sessions are held are fitted up with judges' benches, clerks' desks, jury-boxes, and counsel table, and from the time the crier announces that the court is in session until he announces its adjournment the procedure is identical with that of a regular judicial tribunal.

It is believed that any student who gives the proper attention to this feature of the law curriculum will be enabled to go out from this institution and creditably try cases in court, although he may never have been in an actual court-room.

A careful record is kept of the work of each student, both as to his pleadings and his conduct of the case in court, and the ratings thus given determine, in connection with his ratings upon other subjects, whether or not he is entitled to a degree.

B. LEGAL TACTICS.

Every young lawyer entering upon his professional career is desirous of availing himself of the experience of an older practitioner and of learning many things which are not taught and cannot be taught from books. It is to meet the needs of this class of men that this course has been inaugurated. It is in charge of a member of the Washington Bar whose practice has been an active one, extending over a period of many years.

A short introductory talk is given upon the relations between attorney and client, including the important subject of fees, after which the student is given the benefit of practical hints upon the manner of start-

ing in practice and opening and furnishing an office, with suggestions as to office systems. Then a drill is given upon contract drafting, involving the preparation by the student of leases, contracts, wills, etc. The students' papers are carefully examined by the instructor and criticised, prevalent errors and the proper manner of curing them being pointed out in the class-room.

The student is told how to listen intelligently to his client's grievances; how to draw up the pleadings arising out of these grievances; how to prepare for trial the case thus made, including the work of preparing the evidence; how to try the case and examine and cross-examine witnesses; the manner of making up the record, writing briefs, and conducting the argument on appeal. The subject of professional ethics is discussed. At various times during the year distinguished lawyers are invited to appear and discuss informally special topics of interest to the students.

EXAMINATIONS.

A. UNDERGRADUATE COURSES.

Regular Examinations:

Written examinations upon all required subjects are held at the close of each semester upon those subjects that have been completed during that semester. All students, unless specially excused by the Dean, are required to take the first examination held in any subject after their completion of the course in that subject.

No student, except by special permission of the Dean, will be allowed to take an examination in any subject unless he shall be regularly registered and have been in regular attendance upon the lectures and have done all the work required in the course of instruction upon that subject.

Conditions:

The regular examinations for the removal of conditions will be held during the first week of each session. Applications for permission to take any of these examinations must be made to the Dean, in writing, not later than three days before the date for which such examination is scheduled. Candidates for the degree of Bachelor of Laws who have not more than one condition in the subjects completed during the first semester of the third year may be given examinations for the removal of such conditions during the last week in May.

Class Standing:

Students having conditions in more than two subjects will not be advanced from one class to another. Students may have, however, an opportunity to remove conditions, imposed during any session by

taking the regular examinations for the removal of conditions at the beginning of the following session, for which no fee is charged.

Students having conditions in more than three subjects will not be allowed to register except upon special permission from the Dean.

Special Examinations:

No special examinations, other than those above provided for, will be granted to any students except those of the graduating class who, for good cause, shall have been excused by the Dean from taking any regular examination during the third year.

B. GRADUATE COURSES.

Examinations in graduate courses will be given at such times and under such conditions as may be designated by the professors in charge.

DEGREES.

1. BACHELOR OF LAWS.

The degree of Bachelor of Laws will be conferred upon students who shall have passed satisfactory examinations upon the subjects required in the entire course of three years and whose attendance and conduct have been satisfactory to the Faculty.

2. MASTER OF LAWS.

The degree of Master of Laws will be conferred upon students who have successfully completed the work prescribed for the fourth year and whose attendance and conduct have been satisfactory to the Faculty.

3. MASTER OF PATENT LAWS.

The degree of Master of Patent Law will be conferred upon students who shall have successfully completed the work of the Patent Law course and whose attendance and conduct have been satisfactory to the Faculty.

4. DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence is given for graduate work in the science of the law upon the same terms and conditions as the degree of Doctor of Philosophy in the Departments of Arts and Sciences and of Politics and Diplomacy.

The degree is conferred upon students already qualified as candidates for the degree who have pursued advanced legal studies and engaged in original research in some special branch of law under University auspices for a period of not less than three years, two of which shall be in residence, and have submitted an acceptable thesis and met all the

requirements prescribed. The degree is given, however, not because of the faithful completion of a course of study according to a stated program for a given length of time, but for high attainments and proved ability to do research work in some special branch of law, as determined by the various tests applied.

The applicant may be credited with graduate work done at other universities, provided that such work is shown to be of grade and nature similar to that required here, but at least one year must be spent in residence at this University, and the other requirements of the degree as prescribed here must be fulfilled.

Every candidate immediately after qualifying for the degree of Doctor of Jurisprudence shall designate one principal or major subject and two subordinate or minor subjects, the selection to be approved by the Faculty. The major subject and at least one of the two minors must be topics taught in the Department of Law and Jurisprudence; the other minor may be chosen from any graduate work in the University properly relative to his major and approved by the Faculty. The major and minors must be pursued under the guidance of a committee consisting of the professors in charge of the subjects chosen, with the professor in the major subject as chairman. This committee shall determine his division of time, study, and research among the major and minor topics, but in general at least one-half of the whole time spent in graduate work should be devoted to the major subject and one-fourth of the time to each of the minor subjects.

The candidate must attend the seminary work in his major subject and take the graduate courses given in his major and minors.

The candidate shall pass satisfactory examinations upon the three subjects selected, which may be taken on the fulfilment of the requirements as to residence or at such other times as may be fixed by the committee in charge of such candidate. In his major subject the candidate must show special attainments, and is liable to minute examination upon the whole ground which it covers. He is also expected to have a good general knowledge of the field contained within his two minor subjects.

A satisfactory thesis must be presented by the candidate, together with an exhaustive bibliography, exhibiting independent research in some branch of his major subject, not later than January 15 or May 1 in the year in which the degree is sought, according as he proposes to be graduated at the Winter Convocation or at Commencement.

After their acceptance theses are the property of the University, and must be deposited in the University archives, but authors are permitted to make copies. All theses must be typewritten on official theses paper, which may be obtained from the Assistant Treasurer of the University.

No thesis for the degree of Doctor of Jurisprudence shall be submitted to the Faculty until it has been approved by the professor in supervision of the major topic, and also by a co-referee to be appointed by the Faculty. The referees shall present to the Faculty written reports of the thesis, to be filed therewith.

The candidate is expected to print his thesis, under the supervision of the professor in charge of his major topic, within one year after the degree is conferred, and shall present one hundred copies to the University, to be distributed among institutions of learning.

The candidate must defend his thesis in the presence of the Faculty or of so many of its members as may be designated by the Faculty.

LAW LIBRARY AND READING-ROOM.

A well-equipped working library, comprising more than 4,500 volumes, is open to the students in Law Lecture Hall from 9 a. m. to 10 p. m. Competent librarians are in charge and will give students assistance in looking up subjects and in the use of books.

The Library contains the standard textbooks, the West Reporter system of Federal and State Decisions complete, State Reports, the English Common Law and Chancery Reports, Encyclopædias of Law, Digests, reference books, and current law publications.

Adjoining the Library is a conversation-room for students, affording opportunity for consultation.

In addition to these facilities, the students have free access to the Congressional Library and other public libraries.

PRIZES.

A prize offered by the Edward Thompson Company, of a set of the Encyclopædia of Law, first or second edition, or a set of the Encyclopædia of Pleading and Practice, is awarded each year to the senior law student who shall write the best thesis on some legal subject to be assigned by the Faculty.

Three prizes—one of \$40, one of \$30, and one of \$20—are annually given to the respective authors of the best three essays handed in by such members of the Third-Year Class as shall compete for them and shall pass successful examinations.

A prize of \$25 in gold, offered by Mr. Fritz von Briesen, called the "Ellsworth Prize," is awarded for the best work done in the Patent Law Course by a student receiving the degree of Master of Patent Laws.

PRIZE ESSAY IN COMPARATIVE LAW.

In order to stimulate interest in the study of Comparative Law, not only in this University but throughout the United States and Canada, a prize of \$100.00 is awarded each year to the writer of the best essay on some topic in Comparative Law, to be assigned by the Faculty. Competition for this prize is open to all *bona fide* students regularly matriculated in any law school in the United States, Mexico, or Canada. All essays must be submitted each year on or before March 1, and after they have been passed upon by a committee of one or more persons not connected with this University, the award will be announced June 1. Essays should be sent to the secretary of the Faculty. The subject assigned for the year 1906-07 was as follows:

A discussion, under English, French, and German law, of the respective rights of parties to a contract entered into under a mistaken apprehension on the part of one or both parties as to its legal effect.

John H. Wigmore, Dean of the Northwestern University Law School, and Samuel Williston, Weld Professor of Law in Harvard Law School, form the committee of award for the year 1906-07.

The following subject is assigned for the year 1907-08:

A comparative treatise upon the rights of one purchasing chattels from a seller whose title is defective, under the laws of the United States, England, France, and the Spanish-American countries.

PUBLIC SPEAKING.

Excellent facilities for training in the art of public speaking are afforded by the two debating societies that have been organized in the Department of Law and Jurisprudence. These societies, known as the Columbian and Needham Debating Societies, meet weekly for debate in Law Lecture Hall. Membership in these societies is entirely optional, but their work is encouraged in every legitimate way by the Faculty, and students are urgently advised to take part in their exercises. During each academic year several intercollegiate debates are held. Membership upon the intercollegiate debating teams is an honor eagerly sought and made the prize to be won in separate preliminary contests. The general conduct of these intercollegiate debates is under the supervision of a committee from the Faculty.

INSTRUCTION IN ORATORY.

Instruction in Oratory is under the charge of Mr. Robert Hickman. The course given is designed to afford practical and effective training in the art of public speaking, argumentation, and debate.

The instructor's work is principally done in connection with the sessions of the University Congress, a legislative body modeled after the

Congress of the United States, and composed of members of Mr. Hickman's classes and such other students as are admitted to it in accordance with its regulations. The sessions of this organization afford Mr. Hickman the opportunity to give practical demonstration of the application of the theoretical principles governing the art of oral expression, as well as to give thorough training and practice in parliamentary law and procedure.

ADMISSION TO THE BAR OF THE DISTRICT OF COLUMBIA.

By the rules of the Supreme Court of the District of Columbia, applicants for admission to the Bar are required to have studied law for three years under the direction of a competent attorney, but by those rules the course in the Department of Law of the University is regarded as discharging this requirement.

FEES.

1. Matriculation fee (payable only on first entry into the University)	\$5
2. Library fee per annum	2
3. Tuition fees per annum:	
For the regular three year course.....	150
For the four year course (nine hours per week).....	120
4. Fee for graduation	10
5. Tuition fee for course in Patent Law.....	40
6. Tuition fee per annum for any year repeated once.....	75
7. Tuition fees per annum for special courses are noted on page 121, paragraph 6.	
8. Fee for a certificate under the seal of the University.....	2

No change will be made in the fees fixed at the time of registration except in case of withdrawal, and then only upon notice in due form, and from the end of the current quarter session when such withdrawal shall be approved. Applications for the granting of a withdrawal should be made on the prescribed form to be obtained from the Registrar and will only be received at the end of a quarter session.

The library fee will not be charged for the first half-year during which a course is completed in the case of students who enter at the beginning of the second half-year and pay the library fee for that year.

PAYMENT OF FEES.

All fees are to be paid to the Treasurer. Regular tuition fees are payable quarterly in advance. Fees for special courses are payable monthly in advance. Matriculation and library fees are payable in full in advance.

BOARD AND ROOMS.

A register of approved boarding houses is kept by the Treasurer.
Accommodations cost from \$25 to \$40 a month.

For catalogues, application blanks, and further information address

THE REGISTRAR,
The George Washington University,
Washington, D. C.

National College of Pharmacy.

FACULTY.

CHARLES WILLIS NEEDHAM, LL.D.....	PRESIDENT OF THE UNIVERSITY
HENRY E. KALUSOWSKI, M.D., Phar.D.....	Dean and Professor of Pharmacy
SAMUEL WAGGAMAN, M.D., Phar.D.....	Professor of Materia Medica. Botany and Toxicology
WILLIAM F. HILLEBRAND, Ph.D., Phar.D.....	Professor of Chemistry and Physics
FREDERICK A. HOLTON, B.S., Phar.D...	Professor of Analytical Chemistry
BURTON J. HOWARD, B.S.....	Professor of Microscopy
HOWARD M. BRADBURY, Phar.D.....	Assistant to the Professor of Analytical Chemistry
HARRY A. CANDEE, Phar.D.....	Assistant to the Professor of Pharmacy
CYRUS W. NELSON, B.S.....	Assistant to the Professor of Pharmacy
FRED H. PITZER.....	Assistant to the Professor of Pharmacy
*-----	Professor of Mercantile Pharmacy
*-----	Professor of Pharmaceutical Jurisprudence

GENERAL STATEMENT.

The National College of Pharmacy, which is an outgrowth of the Columbian Pharmaceutical Association, organized in April, 1871, was chartered under the provisions of an act of Congress in 1872, and opened its doors to students November 11th of that year. In February, 1906, it became a member of the educational system of The George Washington University, under the charter of the University granted by Congress March 3, 1905, providing for the organization of colleges. The President of the University is *ex-officio* president of the National College of Pharmacy, and the College is represented in the President's Council by its Dean.

The work of the college embraces courses in chemistry and toxicology, materia medica, botany, pharmacy, analytical chemistry, and pharmaceutical laboratory work and microscopy. Courses have recently been added in mercantile pharmacy and pharmaceutical jurisprudence. Three years are required for the completion of the prescribed course.

The new College building is centrally located on I street, northwest, between Eighth and Ninth streets. It is easily reached by either of the four principal street car lines of the city.

*To be appointed.

SPECIAL COURSES.

Students may select one or more of the branches taught and attend the lectures and laboratory work during the time set apart for such study.

Students taking single tickets are not entitled to take the examinations for the degree conferred by the College.

THE DEGREE.

The degree conferred is *Doctor of Pharmacy*.

QUALIFICATIONS FOR THE DEGREE.

1. He shall have attended three courses of instruction in Chemistry, Pharmacy, Analytical Chemistry, Materia Medica, Botany, and Toxicology, and two in Microscopy, the last of which must have been in this College; and one course each in Mercantile Pharmacy and Pharmaceutical Jurisprudence.

2. He must have passed a satisfactory examination in each of the branches taught.

3. He must be recommended by the Board of Examiners.

MATERIA MEDICA, BOTANY AND TOXICOLOGY.

FRESHMAN COURSE.

The first lectures are an introductory to the study of elementary botany, after which follow vegetable histology and plant physiology. The subject-matter of these lectures is thoroughly explained by means of charts, diagrams, and specimens.

JUNIOR COURSE.

This course is devoted to the consideration of the various theories concerning the vegetable world and the practical results obtained by experienced laborers in this science. The lectures are illustrated by means of the lantern and microscope. A large part of the course is devoted to a consideration of the official organic drugs.

SENIOR COURSE.

The lectures are mainly upon the active principles, adulterants, official preparations, therapeutic uses, and doses; after which the organic and inorganic poisons are taken up under three heads: 1st, Corrosive; 2d, Irritant; and 3d, Neurotic Poisons. Under these three divisions are explained briefly their action, detection, and antidote.

PHARMACY.

FRESHMAN COURSE.

This course is given to the study of the various pharmaceutical processes and operations. Following in the order named are lectures on Metrology, heat, thermometry, evaporation, distillation, fusion, sublimation, calcination granulation, comminution, solution, filtration, clarification, decoloration, precipitation, crystallization, and extraction, during which the various methods used to bring about the desired results will be illustrated.

JUNIOR COURSE.

During a part of this course the time is given to the application of the processes considered during the Freshman year to pharmacopœial preparations, and such modifications as adapt them to special uses. This includes methods for making solutions of various substances, extracts, pills, tablets, triturates, compressed tablets, capsules, powders, suppositories, plasters, ointments, cerates, and oleates.

The latter part of this course is taken up with the study of official preparations obtained from the elementary bodies beginning with bromine, chlorine, iodine, phosphorus, and sulphur, followed by carbon, boron, silicon, the inorganic acids, potassium, sodium, lithium, ammonium, magnesium, calcium, barium, zinc, aluminum, cerium, cadmium, manganese, iron, chromium, lead, silver, copper, mercury, antimony, arsenic, bismuth, and gold.

SENIOR COURSE.

The time during this course is mainly given to the study of compounds chiefly derived from organic matter, and products obtained therefrom, amylaceous and saccharine substances; glucosides and alkaloids, volatile oils and animal products commonly used in pharmacy, vegetable oils, soaps, resinoids and products from resins.

ANALYTICAL CHEMISTRY.

The instruction in this department is intended to present the chemical tests of the United States Pharmacopœia, with methods for the identification of substances and for the detection of impurities; to instruct him in the methods of assaying and the use of volumetric solutions, and to enable students to analyze any ordinary mixture of inorganic material.

For the purpose of carrying out the work of this department a large, well-equipped laboratory is provided with all the usual water and gas facilities, and has recently been wired and installed with electric appa-

ratus whereby electro-chemical methods of analysis can be taught and the application of the electric current to the preparation of chemicals by the methods of electro-chemistry can be illustrated before the students. These and other facilities afford students exceptional opportunities to become familiar with the fundamental principles of the science of chemistry.

The first year is devoted to experimental work so arranged as to supplement the lectures in General Chemistry.

The second year covers a systematic course in qualitative analysis in connection with the tests of the United States Pharmacopœia.

The third year is devoted to volumetric analysis by means of the standard solutions of the Pharmacopœia.

GENERAL CHEMISTRY AND PHYSICS.

Inasmuch as the subjects of Analytical Chemistry and Pharmacy are fully provided for in other courses, these lectures are devoted more closely to the fundamental principles and classification which must underlie a thorough and systematic knowledge of Chemistry. Owing to the intimate connection existing between Chemistry and several branches of Physics, a number of lectures illustrating the more important laws and principles of some of these branches precedes the regular course in Chemistry, and others on these subjects with which a prior acquaintance is less important, follow after the student has acquired some knowledge of chemical changes. During the first half of the second year Physics and the non-metallic elements receive consideration, followed during the remainder of the second and a portion of the third year by the metals. The greater portion of the third year is devoted to the exposition of the more important facts, principles, and theories of Organic Chemistry.

MICROSCOPY.

This College has established a separate course in this branch and requires full attendance from Junior and Senior students. The course of Microscopy gives instruction in the use of the compound microscope as an aid in the study and identification of drugs.

The work includes both lectures and laboratory courses, and consists in the examination of plant tissue as illustrated in various vegetable substances most familiar to pharmacists. Special attention is given to the structural characteristics by which one drug can be distinguished from another as well as to the detection and identification of the most common adulterants used.

MERCANTILE PHARMACY AND PHARMACEUTICAL JURISPRUDENCE.

These courses are required in the Senior class only. The names of the lectures and titles of text-books will be announced later.

FEES.

Matriculation	\$5
Tickets for the full year's course of instruction, Freshman or Junior.	70
Tickets for the full year's course of instruction, Senior.....	80
Single tickets for Chemistry, Materia Medica, Botany and Toxicology, each	15
Single tickets for Analytical Chemistry.....	20
Single tickets for Practical Pharmacy.....	20
Single tickets for Microscopy	10
Single tickets for Mercantile Pharmacy.....	5
Single tickets for Pharmaceutical Jurisprudence.....	5
Fee for Diploma	10

SCHEDULE.

The thirty-fifth annual session of the College will begin on Wednesday, September 25, 1907, and close on Wednesday, June 5, 1908.

Monday.	Tuesday.	Wednesday.
FRESHMEN.	SENIORS.	FRESHMEN.
Botany.	Microscopy.	Physics and General Chemistry.
Lectures and Recitations, 10 to 11 a. m.	Lectures, Laboratory Work and Recitations, 6 to 8 p. m.	Lectures and Recitations, 6 to 7 p. m.
Pharmacy.	October 5 to February 12.	Analytical Chemistry.
Lectures and Recitations, 11 a. m. to 12 m.	Mercantile Pharmacy.	Lectures, Recitations and Laboratory Work, 7 to 11 p. m.
Recess, 12 m. to 1 p. m.	8 to 10 p. m.	
Pharmacy.	Feb. 12 to End of Term.	
Laboratory Work, 1 to 4 p. m.	Pharmaceutical Jurisprudence.	
JUNIORS.	8 to 9 p. m.	
Physics and General Chemistry.		
Lectures and Recitations, 6 to 7 p. m.		
Analytical Chemistry.		
Lectures, Recitations and Laboratory Work, 7 to 11 p. m.		

SCHEDULE.

Thursday.	Friday.	Saturday.
SENIORS. Materia Medica and Toxicology. Lectures and Recitations, 10 to 11 a. m. Pharmacy. Lectures and Recitations, 11 a. m. to 12 m. Recess, 12 m. to 1 p. m. Pharmacy. Laboratory Work, 1 to 4 p. m. JUNIORS. Microscopy. Lectures, Laboratory Work and Recitations, 6 to 8 p. m.	SENIORS. General and Organic Chemistry. Lectures and Recitations, 6 to 7 p. m. Quantitative Chemical Analysis. Lectures and Recitations, 7 to 11 p. m.	JUNIORS. Botany and Materia Medica. Lectures and Recitations, 10 to 11 a. m. Pharmacy. Lectures and Recitations, 11 a. m. to 12 m. Recess, 12 m. to 1 p. m. Pharmacy. Laboratory Work, 1 to 4 p. m.

Entrance examination at 1 p. m. on Thursday, September 19, 1907, the lecture-room of the College. Annual examination of Freshmen and Juniors for promotion and of Seniors for graduation begins on Monday, May 11, 1908.

PART III.
STUDENTS IN THE UNIVERSITY.
DEGREES CONFERRED, MISCELLANEA.

Students in the University.

DEPARTMENT OF ARTS AND SCIENCES.

GRADUATE STUDIES.

Master of Arts.

Name.	Legal residence.	City address.
Crawford, Angus McDonald.	.... Va.	Alexandria, Va.
A.B., 1906, The George Washington University.		
<i>Topics</i> —Major, English Literature; Minors, French, German.		
Edler, August Friedrich Wilhelm.	Germany	...3513 Center Street.
A.B., 1906, The George Washington University.		
<i>Topics</i> —Major, Germanics; Minors, History, International Law.		
Kramer, Stephen Elliott.	..... D. C.	1318 S Street, N. W.
B.S., 1906, The George Washington University.		
<i>Topics</i> —Major, Pedagogical Psychology; Minors, Political Theory, Sociology.		
McMahon, Margaret Agnes.	..... N. Y.	1342 R Street, N. W.
B.S., 1906, The George Washington University.		
<i>Topics</i> —Major, American History; Minors, English History, English.		
Moore, Robert Irwin.	..... Tenn.	1408 M Street.
B.A., 1898, Vanderbilt University.		
<i>Topics</i> —Major, Contemporaneous History; Minors, Latin, Industrial Evolution.		
Paddock, Ernest Moorhead.	..... Pa.	934 North Ave., Allegheny, Pa.
A.B., 1894, University of Pennsylvania, Graduate,		
1897, Episcopal Theological School, Cambridge, Mass.		
<i>Topic</i> —Philosophy.		
Ross, John Elliot.	..... D. C.	614 19th Street.
A.B., 1903, Loyola College.		
<i>Topics</i> —Major, English; Minors, History, Economics.		
Russell, Alice Dyar.	..... Minn.	318 Patent Office
B.A., 1903, Minnesota State University.		
<i>Topics</i> —Major, Philosophy; Minors, Sociology, Economics, History and Psychology of Religion.		
Sniffin, William Webb.	..... D. C.	312 N. C. Ave., S. E.
A.B., 1906, The George Washington University.		
<i>Topics</i> —Major, French of 19th Century; Minors, Spanish, English.		

Name.	Legal residence.	City address.
Walsh, Daniel Michael.....	Vt.	Lincoln Apartment.
B.S., 1904, University of Vermont.		
<i>Topics</i> —Major, Economics; Minors, History, Political Theories.		
Young, Julia Elektra Ludlow....	N. Y.	Nat'l Cathedral School.
B.A., 1906, Barnard College, Columbia University.		
<i>Topics</i> —Major, Latin; Minors, Greek, Archaeology.		

Master of Science.

Coffey, George Nelson.....	N. C.	1225 11th Street.
Ph.B., 1900, University of North Carolina.		
<i>Topics</i> —Major, Principles of Soil Classification; Minors, Practical Meteorology, Mineralogy.		
Gilbert, Walter Merwin.....	N. Y.	1831 G Street.
B. S., 1899, College of City of New York.		
<i>Topics</i> —Major, Philosophy; Minors, English, Philosophy of Hegel.		
Goodnow, Edward Harold.....	Mass.	1327 M Street.
B.S., 1905, Worcester Polytechnic Institute.		
<i>Topics</i> —Major, Physical Chemistry; Minors, Organic Chemistry, Mathematics.		
Harrington, Katherine	D. C.	Conduit Road.
B.S., 1906, The George Washington University.		
<i>Topics</i> —Major, Higher Differential Equations; Minors, Light, Experimental and Mathematical, Organic Chemistry.		
Houghton, Harry Wilson.....	Md.	Glen Echo, Md.
B.S. in Chemistry, 1906, The George Washington University.		
<i>Topics</i> —Major, Biochemistry; Minors, Stereo-chemistry, Hygiene.		
Sanders, Frances	D. C.	1360 Kenyon Street.
B.S., 1901, Columbian University.		
<i>Topics</i> —Major, Mathematics; Minors, Applied Mechanics, Philosophy.		
Smith, Delos Hamilton.....	D. C.	1905 F Street.
B.S. in Architecture, 1906, The George Washington University.		
<i>Topics</i> —Major, Architectural Design; Minors, Architecture.		
Smith, Edwin, Jr.....	Md.	Rockville, Md.
B.S. in Chemistry, 1906, The George Washington University.		
<i>Topics</i> —Major, Researches in Electrochemistry; Minors, Bacteriology, Economic Geology.		
Taber, Walter Cox.....	Calif.	Bureau of Soils.
A.B., 1898, Leland Stanford, Jr., University.		
<i>Topics</i> —Major, Chemistry; Minor, Mathematics.		

In Attendance.

- | Name. | Legal residence. | City address. |
|--|------------------|-----------------------|
| Custis, Horace Hatch..... | D. C. | 912 15th Street. |
| B.A., 1906, Johns Hopkins University. | | |
| Topic—Chemistry. | | |
| Graves, Sheldon Heber..... | D. C. | 1221 K Street. |
| B.S., 1904, M. S., 1906, The George Washington University. | | |
| Topic—Electrical Engineering. | | |
| Heininger, Lewis | Ohio | 2514 13th Street. |
| A.B., 1887, A.M., 1890, North Western College. | | |
| Topic—Botany. | | |
| Keith, Oscar Lovell..... | D. C. | 16 3d Street, S. E. |
| A.B., 1902, University of Georgia, A.M., 1904, Harvard University. | | |
| Topic—French. | | |
| Kolbe, Lawrence Albert..... | Ohio | Bureau of Soils. |
| A.B., 1904, Oberlin College. | | |
| Topic—Geology. | | |
| Lamson, Eleanor Annie..... | D. C. | 2439 18th Street. |
| B.S., 1897, M.S., 1899, Columbia University. | | |
| Topic—Celestial Mechanics. | | |
| Owen, Frederick Denison..... | Conn. | 3 Grant Place. |
| B.S., 1905, M.S., 1906, The George Washington University. | | |
| Topics—Archæology, Æsthetics. | | |
| Shields, Walter Clement..... | Pa. | 1335 Connecticut Ave. |
| Topics—English. | | |
| Teegarden, Alice May..... | Pa. | Kendall Green. |
| B.A., 1906, Blairsville College. | | |
| Topic—Archæology. | | |

Doctor of Philosophy.

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|---|------------|----------------------|
| Alden, Levi Russell..... | D. C. | 809 L Street. |
| B.A., 1903, M.A., 1904, Columbian University. | | |
| Topics—Major, American History; Minors, History of English Law, Mediæval History. | | |
| Backus, Cyrus Day..... | N. Y. | U. S. Patent Office. |
| Ph.B., 1896, LL.B., 1896, Cornell University; B.S., 1904, Columbian University; M.S., 1905, The George Washington University. | | |
| Topics—Major, Electrical Engineering; Minors, Physics, Chemistry. | | |
| Brodthage, Rev. George..... | Germany .. | 320 4½ Street, S. W. |
| Maturity for University studies, Strassburg; 12 semesters University of Strassburg, Berlin, Göttingen. | | |
| Topics—Major, Germanics; Minors, History, Philosophy. | | |

Name.	Legal residence.	City address.
Church, Calvin Grant.....	Md.	111 12th Street, S. E.
B.S., 1900, Maryland Agricultural College.		
M.S., 1902, Columbian University.		
Topics—Major, Agricultural Chemistry; Minors, Physical Chemistry, Analytical Chemistry.		
Clark, Marion	Md.	Cecilton, Md.
B.A., 1901; M.A., 1903, Western Maryland College.		
Topics—Major, American History; Minors, Constitu- tional Law, International Law.		
Day, Herbert Ernest.....	D. C.	Kendall Green.
Ph.B., 1893, Brown University.		
M.A., 1895, Gallaudet College.		
M.A., 1901, Columbian University.		
Topics—Major, American History; Minors, English History, American Literature.		
Doan, Mary	Ind.	10th St. and Grant Pl.
B.S., 1891, M.S., 1893, Purdue University.		
B.L., 1892, Earlham College.		
Topics—Major, English Literature; Minors, Soci- ology, Philosophy.		
Doyle, Aida Mary.....	Penn.	1123 Dartmouth Street.
B.S., 1898, M.S., 1899, Columbian University.		
Topics—Major, Chemistry; Minors, Agricultural Chemistry, Geology.		
Edler, August Friedrich Wilhelm.....	Germany ...	3513 Center Street.
B.A., 1906, M.A., 1907, The George Washington University.		
Topics—Major, The Foreign Policy of Friedrich II. (History of Prussian Politics during 18th century); Minors, Political Theory, American Politics.		
Gardner, James Henry.....	Ky.	U. S. Geological Survey.
B.S., 1900, M.S., 1906, Kentucky State College.		
Topics—Major, Economic Geology; Minors, Strati- graphic Geology, Zoology.		
Grover, Frederick Warren.....	Mass.	409, The Ontario.
B.S., 1899, Massachusetts Institute of Technology.		
M.S., 1901, Wesleyan University.		
Topics—Major, Physics; Minors, Mathematics, Cele- stial Mechanics.		
Hall, Percival	D. C.	Kendall Green.
B.A., 1892, Harvard University.		
M.A., 1893, Gallaudet College.		
M.D., 1890, Columbian University.		
Topics—Major, Pure Mathematics; Minors, Applied Mathematics, Astronomy.		
Heth, Eva Virginia.....	D. C.	1759 Church Street.
A.B., 1892, A.M., 1893, Columbian University.		
Topics—Major, Latin; Minors, German, Classical Archæology.		

Name.	Legal residence.	City address.
Hillyer, William Eldridge.....	D. C.	1365 Park Road.
B.S., 1899, M.S., 1900, Columbian University.		
<i>Topics</i> —Major, Chemistry; Minors, Electro-chemistry, Alternating Current Theory and Machinery.		
Hinman, Ida	Iowa	1529 Q Street.
B.S., 1892, A.M., 1902, Columbian University.		
<i>Topics</i> —Major, English; Minors, German, French.		
Huidekoper, Frederic Louis.....	D. C.	1614 18th Street.
A.B., 1896, Harvard.		
<i>Topics</i> —Major, European History; Minors, English History from 1784 to 1885.		
Kimball, Herbert Harvey.....	N. H.	Library, U. S. Weather Bureau.
B.S., 1884, N. H. C. A. and M. A.		
M.S., 1900, Columbian University.		
<i>Topics</i> —Major, Astro-Physics; Minors, Meteorology, Practical Meteorology.		
Ludlow, Clara Southmayd.....	D. C.	The Plaza.
B.S., 1900, M.S., 1901, A. and M. College, Miss.		
<i>Topics</i> —Major, Preventive Medicine; Minors, Histology, Physiology; (Human) Anatomy, Bacteriology and Pathology.		
Lyon, Marcus Ward, Jr.....	N. J.	National Museum.
Ph.B., 1897, Brown University.		
M.S., 1900, M.D., 1902, Columbian University.		
<i>Topics</i> —Major, Zoölogy; Minors, Neurology, Histology.		
MacDonald, Donald Francis.....	Wash.	Geological Survey.
B.S., 1905, University of Washington State.		
M.S., 1906, The George Washington University.		
<i>Topics</i> —Major, Geology; Minors, Paleontology, Mineral Chemistry.		
Maguire, Thomas Francis James..	D. C.	1736 U Street.
B.S., 1897, Massachusetts Institute of Technology.		
<i>Topics</i> —Major, Physics; Minors, Advanced Dynamo Design, Electro-Chemistry.		
Marsh, Millard Caleb.....	N. Y.	Bureau of Fisheries.
B.S., 1897, Cornell University.		
M.S., 1903, The George Washington University.		
<i>Topics</i> —Major, Analytical Methods; Minors, Bacteriology, Biochemistry.		
Marshall, Elmer Eugene.....	D. C.	1327 Newton Street.
B.A., 1889, Ohio Wesleyan University.		
S.T.B., 1904, Boston University.		
<i>Topics</i> —Major, History; Minors, Philosophy, Biblical Literature.		
Mattern, Louis Wilson.....	Penn.	McKinley School.
B.S., 1894, Pa. State College.		
<i>Topics</i> —Major, Chemistry; Minors, Biochemistry, Physical Chemistry.		

- | Name. | Legal residence. | City address. |
|---|------------------|------------------------|
| Mills, Joseph Strayer..... | Md. | Central High School. |
| B.A., 1890; M.A., 1893, Western Maryland College. | | |
| <i>Topics</i> —Major, Chemistry; Minors, Mineralogy
Physica. | | |
| Newberne, Robert Edward Lee... | Texas | 914 New York Avenue. |
| M.D., 1893, Georgetown University. | | |
| D.D.S., 1898, Tacoma College Dental Surgery. | | |
| B.S., 1901, M.S., 1901, Columbian University. | | |
| <i>Topics</i> —Major, Neurology; Minors, Anatomy, Physiology. | | |
| Newton, Elmer Slayton..... | Mass. | Rm. 64, The Brunswick. |
| B.A., 1895, Amherst. | | |
| M.D., 1905, The George Washington University. | | |
| <i>Topics</i> —Major, Organic Chemistry; Minors, Bacteriology, Bio-chemistry. | | |
| Norton, John Bitting Smith..... | Md. | College Park, Md. |
| B.A., 1896, M.S., 1899, Kansas State Agricultural College. | | |
| <i>Topics</i> —Major, Botany; Minors, Plant Chemistry, Chemistry. | | |
| Orth, Henry, Jr..... | D. C. | 1011 L Street. |
| M.E., 1893, Lehigh. | | |
| M.S., 1899, Columbian University. | | |
| <i>Topics</i> —Major, Physical Chemistry; Minors, Organic Chemistry, Theoretical Chemistry. | | |
| Patrick, George Edward..... | Iowa | Dept. of Agriculture. |
| B.S., 1893, M.S., 1894, Cornell University. | | |
| <i>Topics</i> —Major, Agricultural Chemistry; Minors, Bacteriology, Bio-chemistry. | | |
| Peake, James Frederick..... | Va. | 927 F Street, N. W. |
| B.A., 1903, Randolph Macon College. | | |
| M.A., 1904, Columbian University. | | |
| <i>Topics</i> —Major, American History; Minors, Latin, English. | | |
| Portner, Edward George..... | D. C. | Alexandria, Va. |
| B.S., 1897, M.S., 1898, Columbian University. | | |
| <i>Topics</i> —Major, Chemistry; Minors, Physical Chemistry, Mineral Chemistry. | | |
| Reynolds, John Merriam..... | Pa. | Cosmos Club. |
| M.A., 1905, Columbian University. | | |
| <i>Topics</i> —Major, Philosophy; Minors, Continental History, Political Philosophy. | | |
| Richards, Luther Adolph..... | Va. | 1100 N. Y. Avenue. |
| B.A., 1902, M.A., 1903, M.S., 1904, Columbian University. | | |
| <i>Topics</i> —Major, Astronomy; Minors, History of Astronomy, Solar Physica. | | |

STUDENTS IN THE UNIVERSITY.

197

Name.	Legal residence.	City address.
Richardson, Edward Elliott.....	D. C.	404 7th Street, S. W.
M.D., 1895, B.S., 1904, Columbian University.		
M.S., 1905, The George Washington University.		
Topics—Major, Philosophy; Minors, Neurology, Physiology, Experimental Psychology.		
Simon, Abram	D. C.	2606 University Place.
Rabbi, 1894, Cincinnati Hebrew Union College.		
B.L., 1894, Cincinnati University.		
Topics—Major, Philosophy; Minors, English Literature, Biblical Literature.		
Snelling, Walter Otheman.....	Mass.	3412 13th Street.
B.S. in Chem., 1904, Columbian University.		
B.S., Gen. Sci., 1905, Harvard.		
Topics—Major, Chemistry; Minors, Advanced Geology, Chemistry of the Rare Earths.		
Solyom, Herbert Louis.....	Md.	U. S. Patent Office.
B.S., 1902, M.S., 1903, Columbian University.		
Topics—Major, Astro-Physics; Minors, Economics, Meteorology.		
Stiles, George Whitfield, Jr.	Okla.	25½ Bates Street.
B.S., 1900, Oklahoma Agricultural and Mechanical College.		
M.D., 1905, George Washington University.		
Topics—Major, Bacteriology; Minors, Biochemistry, Practice of Medicine.		
Stockberger, Warner W.....	Ohio	3628 10th Street.
B.S., 1902, Denison University.		
Topics—Major, Botany; Minors, Botany, Zoology.		
Swett, Otis Dow.....	Md.	Chevy Chase.
LL.B., 1891, LL.M., 1892, B.S., 1904, Columbian University.		
Topics—Major, Chemistry; Minors, Electrochemistry, Stereochemistry.		
Welsh John Cleveland.....	Tenn.	229 F Street, N. E.
B.S., 1887, Carson and Newman College.		
M.S., 1902, Columbian University.		
Topics—Major, Botany; Minors, Chemistry, Zoology.		
Wilkinson, Benjamin George.....	D. C.	Takoma Park, D. C.
B.A., 1897, University of Michigan.		
M.A., 1905, Union College.		
Topics—Major, History; Minors, American History, English History.		
Wilkinson, Oscar	Miss.	1404 L Street.
M.D., 1896, Tulane University.		
Ph.B., 1902, University of Mississippi.		
M.A., 1903, Columbian University.		
Topics—Major, Physiological Optics; Minors, Therapeutics, Practice of Medicine.		

Name.	Legal residence.	City address.
Witherspoon, Thomas Alfred.....	Tenn.	26 Iowa Circle.
1883, Graduated from U. S. Naval Academy.		
L.L.B., 1891, M.S., 1897, Columbian University.		
Topics—Major, Physical Chemistry; Minors, Chemistry, Electricity.		

COLUMBIAN COLLEGE.

MEN

Bachelor of Arts.

Name.	Legal residence.	City address.
Allison, Joseph Foster.....	D. C.	547 Florida Ave.
Phar.D., The George Washington University.		
Baer, David Alphonse.....	D. C.	3044 N Street.
Berry, James William.....	D. C.	14 3d Street, S. E.
Bogle, John Cowan.....	Ky.	The Wyoming.
Brannin, James Marvin.....	Va.	156 U Street.
Brookes, John Saint Clair, Jr.....	D. C.	1525 Corcoran Street.
Brown, Robson De S.....	Iowa	1346 Monroe Street.
Clark, Henry Culbertson.....	D. C.	Takoma Park.
Covell, David Ransom.....	D. C.	1122 G Street, S. E.
Cragin, Harry Seymour.....	D. C.	1013 L Street.
Crawford, Angus McDonald.....	Va.	Alexandria, Va.
De Lancy, Roi.....	Ohio	1226 12th Street.
Dew, Ray Ellsworth.....	Mo.	1723 Corcoran Street.
Draper, Henry W.....	D. C.	1810 S Street.
Earl, Charles Merritt.....	Wisc.	Office of Indian Affairs.
Eaton, Ernest Risley.....	Australia ..	Y. M. C. A.
Field, John W.....	D. C.	111 11th Street, S. E.
Fosselman, John Jones.....	Pa.	2901 14th Street.
Gates, Edward Percy.....	Ark.	3506 Center Street.
Hall, Mark Anthony.....	Iowa	706 The Sherman.
Johnson, Nelson Trusler.....	Okla.	Brookland, D. C.
Jones, Claude Carville.....	Md.	Mt. Ranier, Md.
Marye, Tench Tilghman.....	D. C.	1526 29th Street.
Miller, William Cammack.....	D. C.	Woodlawn, Cleveland Park, D. C.
Newhouser, Roy Lyman Joseph... Pa.		217 East Capitol Street.
Plass, Joseph.....	Germany ..	226 4th Street.
Powers, Edgar Cordell.....	Md.	Brightwood Park, D. C.
Rhee, Syngman.....	Corea	802 L Street.
Rives, John Joseph.....	N. C.	1533 10th Street.
Rowley, Clifford Alonzo.....	Kansas	1344 Kenyon Street.
Schoenfeld, Hans Fred'k Arthur..	D. C.	1629 Newton Street.

Name.	Legal residence.	City address.
Schreiber, Ernst Otto, Jr.	D. C.	642 E. Street, N. E.
Shallenberger, Don	Ohio	1226 12th Street.
Singleton, Ogle Ridout.	D. C.	2020 H Street.
Smith, Frank Newman.	D. C.	519 The Ontario.
Spencer, Harry Garfield.	D. C.	Congress Heights.
Stout, Joseph Duerson.	D. C.	1104 8th Street.
Van Vleck, William Cabell.	D. C.	800 E Street, N. E.
Wilhelm, Donald	Ohio	1831 G Street.

Bachelor of Science.

Barnett, Victor Hugo.	Ind.	U. S. Geological Survey.
Bond, Eugene Webster.	D. C.	Wash. Loan and Tr. Bg.
Brandenburg, Joseph Franklin.	D. C.	915 French Street.
Curl, Joseph Ryland.	D. C.	416 5th Street.
Dahn, Franz Friedrich Wilhelm.	Minn.	1225 N Street.
Eigelberner, Jesse	Pa.	2026 G Street.
Hornaday, Frank Adelbert.	Texas	232 Post Office Bldg.
Lamb, William Ers.	D. C.	1322 I Street.
McCarthy, Charles Henry.	R. I.	2155 L Street.
Marsh, Hadleigh	D. C.	3525 10th Street.
Mechlin, Ernest Frederick.	D. C.	3020 Cambridge Place.
Miller, Alvin Wilson.	D. C.	2914 N Street.
Molster, Ralph Robertson.	D. C.	3308 9th Street, Brook- land, D. C.
Moneyway, James Lewis.	Ala.	Room 52, Busch Bldg.
Myers, Henry Bernard.	D. C.	1412 Columbia Street.
Nichols, Charles Henry.	Wash.	302 C Street.
Reavis, Andrew Bryant.	Tenn.	3525 11th Street.
Repetti, William Charles.	D. C.	404 Seward Square.
Seiler, Justin Frank.	Ohio	123 12th Street, N. E.
Simms, Terry Boisseau.	D. C.	1458 Clifton Street.
Sterrett, John Adlum.	D. C.	Springland, Pierce Mill Road, D. C.
Stonebraker, Harold English.	Pa.	645 Massachusetts Ave.
Thompson, Oscar	Wisc.	1829 G Street.
Wright, Clarence Aldro.	D. C.	1829 Kalorama Ave.

Bachelor of Science in Chemistry.

Crowe, John Joseph.	D. C.	Bladensburg Road, D. C.
Fuller, Aubrey Vail.	D. C.	2318 1st Street.
McDermott, Frank Alexander.	D. C.	45 U Street.
Marsh, Allen	Ohio	628 E Street, N. E.

Name.	Legal residence.	City address.
Meyer, Will Beck.....	D. C.	609 P Street.
Parker, Charles Edwin.....	D. C.	3153 Mt. Pleasant St.
Pohlmann, Joseph John.....	N. Y.	2917 Olive Ave.
Reed, Edward Oliver.....	D. C.	1216 S Street.
Sherwood, Sidney Forsythe.....	Va.	218 N. Patrick Street, Alexandria, Va.
Shrader, James Houston.....	D. C.	804 9th Street.
Smoot, Charles Calvert.....	Va.	Alexandria, Va.
Wilson, Clarence Paret.....	Md.	Bureau of Chemistry.

Bachelor of Science in Politics.

Allis, Frank Coy.....	N. Y.	814 M Street.
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Special.

Anderson, Henry Melville.....	Ala.	2009 G Street.
Anderson, Howard M.....	Ohio	1531 New Hampshire Ave.
Arlitt, John Louis.....	Texas	2024 F Street.
Aylesworth, William Lot.....	Pa.	Care of Depot Quarter- master, U. S. A.
Beard, William Grant.....	Ind.	214 C Street.
Bieber, Isidor	D. C.	630 G Street, S. E.
Blankemeyer, Francis Xavier.....	D. C.	1205 Vermont Ave.
Block, Theodore	D. C.	155 11th Street, N. E.
Bowker, Charles Harvey.....	N. H.	1349 L Street.
M.D., 1892, Hahneman Medical College.		
M.D., 1900, National University.		
Bradley, Ernest Hazard.....	D. C.	1222 B Street, S. E.
Bradshaw, Paul	D. C.	901 C Street, N. E.
Brown, Robert Harlin.....	Oregon	1130 Park Place, N. E.
Bullough, George Van Ness.....	D. C.	113 Tennessee Av., N. E.
Campbell, Harry Hamilton.....	D. C.	1005 Otis Place.
Carter, James Roy.....	Mich.	1532 O Street.
Caywood, Charles Chester.....	D. C.	1436 Newton Street.
Chadwick, George Albert.....	N. J.	623 South Fairfax Street, Alexandria, Va.
Davis, Allan	Ohio	900 11th Street, S. E.
Domeratzky, Louis	N. Y.	Bureau of Manufactures.
Dwyer, Michael Thomas.....	Va.	603 South Washington Street, Alexandria, Va.
Ferree, Sheridan	D. C.	1720 13th Street.
Finch, Elmer Harrison.....	Mich.	537 21st Street.
Finch, Edmund Louis.....	D. C.	911 S Street.

Name.	Legal residence.	City address.
Fisher, Dwight Wilton.....	D. C.	1921 G Street.
Fisher, Francis Joseph.....	D. C.	1839 R Street.
Garrett, Clyde Davis.....	D. C.	945 O Street, N. W.
Hutchins, Wells Aleck.....	D. C.	1739 Q Street.
Ingersoll, Edwin Henry.....	D. C.	Bureau of Animal In- dustry.
Johnson, Hamilton Crabb.....	Calif.	The Ontario.
Leonard, Lewis Thompson.....	Pa.	525 F Street, N. E.
Locke, John Dexter.....	N. H.	The Normandie.
Lum, David Hurlbut.....	D. C.	128 S Street.
McConville, Arthur Hingeley.....	D. C.	1202 21st Street.
Murray, Fenwick H.....	Md.	Chevy Chase, Md.
Osgood, Whitman.....	Ill.	1402 14th Street.
Preston, Fred Alexander.....	Md.	Room 57, Busch Bldg.
Shoppell, Robert Washington.....	D. C.	The Kenesaw.
Shore, Howard James.....	N. C.	Bureau of Animal In- dustry.
Simons, Robert Stephenson.....	S. C.	1012 13th Street.
Sisco, Henry Nathaniel.....	D. C.	1602 Vermont Ave. A.B., 1898, Battle Creek College.
Stauffer, Henry Edgar.....	Del.	2407 M Street.
Stevens, Herbert Ainsworth.....	Mass.	904 12th Street.
Tibbets, Albert Perkins.....	N. H.	1018 14th Street.
Tong, Yu-Nin.....	China	Chinese Legation.
Vorkoeper, John.....	Wisc.	1921 G Street.
Waterman, Storrs S.....	D. C.	207 R Street.
Watters, William Henry.....	Ohio	1008 22d Street.
Whitfield, Joseph A.....	D. C.	1419 R Street.
Wilson, George Huston.....	D. C.	2331 1st Street.

Auditor.

Entzminger, James F.....	S. C.	935 K Street.
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WOMEN.

Bachelor of Arts.

Name.	Legal residence.	City address.
Adams, Vera Elsie.....	D. C.	503 B Street, N. E.
Baker, Effie Kline.....	D. C.	1728 Columbia Road.
Barbour, Grace Evelyn.....	Mo.	1327 12th Street.
Bethune, Frances Gunby.....	Va.	The California.
Birch, Mary Simpson.....	Va.	Hammond Court.
Birtwell, Bertha.....	Pa.	15 8th Street, N. E.

Name.	Legal residence.	City address.
Bodmer, Annie Elizabeth.....	D. C.	1325 1st Street, S. W.
Burroughs, Elizabeth Harding....	D. C.	515 7th Street, S. E.
Cabell, Clara Winston.....	Va.	Nat'l Cathedral School.
Capell, Isabel Rhoda.....	N. Y.	471 H Street.
Cash, Lilian Claire.....	D. C.	22 Tennessee Av., N. E.
Church, Christine Merrick.....	D. C.	626 North Carolina Ave., S. E.
Clift, Linda Lee.....	D. C.	1408 10th Street.
Cochran, Ruth Gilbert.....	Colo.	2464 Wisconsin Ave.
Conner, Lulu Elizabeth.....	D. C.	Station 47.
Cooke, May Thacher.....	Colo.	1328 12th Street.
Corson, Edna Lois.....	D. C.	1154 17th Street.
Craig, Marion Edith.....	Va.	2020 15th Street.
Crawford, Mary Page.....	Va.	2026 North Capitol St.
Essick, Blanche Lillian.....	D. C.	105 Kentucky Ave., S. E.
Ettenger, Anne Lee.....	Ind.	1507 Lamont Street.
Evans, Helen Marie.....	D. C.	1348 Euclid Street.
Farrington, Charlotte Raynsford..	Minn.	3014 Dent Place.
Field, Ruth Genevieve.....	Wisc.	111 11th Street, S. E.
Haslup, Alice Elma.....	Md.	205 9th Street, S. W.
Hurley, Mary Louise.....	Md.	Rockville, Md.
Lockwood, Vesta Janet.....	D. C.	21 7th Street, S. E.
McAvoy, Catherine Agatha.....	D. C.	1917 17th Street.
McCoy, Louise Winifred.....	D. C.	328 E Street, N. E.
MacMullen, Edgarda Marion....	Pa.	107 2d Street, N. E.
Mahan, Jane	W. Va.	1900 Lamont Street.
Merritt, Pearl Ketcham.....	Minn.	154 F Street, S. E.
Moyer, Jennie	D. C.	610 8th Street, N. E.
Newton, Margaret	D. C.	1625 R Street.
Pearce, Anna Elizabeth.....	D. C.	1425 35th Street.
Person, Ellen Bertha.....	S. D.	3030 Q Street.
Ridout, Edith Hieskell.....	D. C.	1517 Corcoran Street.
Ronald, Ethel Marion.....	D. C.	1601 15th Street.
Salsbury, Annis	Va.	1318 Massachusetts Ave.
Scott, Mabel Lavinia.....	D. C.	1455 Girard Street.
Sebree, Jessie Lydia.....	D. C.	Ammendale, Md.
Stansbury Blanche Gertrude.....	Va.	207 N. Columbus Street, Alexandria, Va.
Swartwout, Jessamine Eliza.....	D. C.	12 Iowa Circle.
White, Emilie Margaret.....	Vt.	2568 University Place.
Wilson, Ruth	D. C.	214 P Street.
Zoelzer, Ella	Ill.	Division D, Patent Office.

Bachelor of Science.

Name.	Legal residence.	City address.
Alden, Levietta Ruth.....	D. C.	809 L Street.
Alexander, Florence B.....	D. C.	1845 North Capitol St.
Allen, Nila Frances.....	Ind.	1303 N Street.
Besselievre, Nellie Ecker.....	Pa.	315 E Street, N. E.
Brackett, Corinne Elizabeth.....	D. C.	1464 Girard Street.
Cochran, Mildred Winans.....	D. C.	2464 Wisconsin Ave.
Field, Eva Cornelia.....	Wisc.	111 11th Street, S. E.
Hathaway, Lillie Theresa.....	Ohio	Division of Appoint- ments.
Johnson, Clara Elizabeth.....	Ind.	1723 G Street.
Johnston, Mildred Floyd.....	D. C.	1762 N Street.
Macmillan, Julia Theckla.....	D. C.	600 Maryland Ave., N. E.
Pfrimmer, Mabel.....	Ind.	1207 1st Street.
Raber, Katherine May.....	Ohio	1326 Park Road.
Saunders, Marie Katherine.....	Okla.	The Brunswick.
Shackelford, Laura.....	D. C.	924 Maryland Ave., N. E.
Steever, Laura Winfield.....	Md.	Forest Service.
Taylor, Margaret Randolph.....	D. C.	1330 U Street.
Van Doren, Emma May.....	D. C.	629 Massachusetts Ave.

Bachelor of Science in Chemistry.

Hildreth, E. Theolian.....	Ala.	1825 Oregon Ave.
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Bachelor of Science in Politics.

Prescott, Ollie Josephine.....	Ill.	1219 Massachusetts Ave.
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Special.

Allen, Jessie M.....	Kansas	1313 Q Street.
Austin, Ella Morgan.....	W. Va.	1208 M Street.
Balloch, Agnes McGrew.....	D. C.	1013 15th Street.
Block, Lydia Hortense.....	D. C.	Library of Congress.
Bryson, Laura Elizabeth.....	Pa.	714 12th Street, N. E.
Denham, Ruth Millicent.....	D. C.	Manor House.
Dufour, Arline Hughes.....	D. C.	1343 L Street.
Edwards, Rowena Adeline.....	Iowa	Weather Bureau.
Harnden, Mabel Blanche.....	Mich.	610 8th Street, N. E.
Harper, Minnie.....	D. C.	619 G Street, S. W.
Hauser, Edna.....	D. C.	1729 1st Street.
Johnston, Margaret Anne.....	D. C.	1633 Irving Street.
King, Winifred Mary.....	D. C.	1803 14th Street.
MacLeod, Helen Mar.....	D. C.	1347 Girard Street.
Moore, Eglantine Lee.....	D. C.	1308 Wallach Place.

Name.	Legal residence.	City address.
Morrisroe, Anna	Ind.	718 19th Street.
Moskedal, Lillian Belle.....	Okla.	215 5th Street, N. E.
Olmsted, Elizabeth	D. C.	816 B Street, N. E.
Page, Marian G.....	D. C.	2001 R Street.
Peet, Elizabeth	N. Y.	Kendall Green.
Sioussat, Marie Theresa.....	D. C.	1801 13th Street.
Smith, Ethel Marion.....	Ill.	1623 Park Road.
Smith, Florence Patterson.....	Ill.	1623 Park Road.
Smith, Marian	D. C.	1650 Newton Street.
Solyom, Stella May.....	Mo.	3028 15th Street.
Stein, Hilda Beatrice.....	D. C.	The Denver.

WASHINGTON COLLEGE OF ENGINEERING.

Bachelor of Science in Civil Engineering.

Name.	Legal residence.	City address.
Adams, Raymond Edmond.....	Pa.	2118 G Street, N. W.
A.B., 1891, C. H. S., Philadelphia, Pa.		
Bacon, James Everett.....	Nebr.	1831 G Street.
Barnum, William Horatio.....	N. Y.	1831 G Street.
Brooks, Walter John.....	Pa.	57 U Street, N. W.
Burchard, Edwin Day.....	D. C.	1530 10th Street, N. W.
Croxton, Roland Albert.....	D. C.	1332 T Street.
Curran, William Joseph Francis.....	Va.	305 1st Street, S. E.
Curtis, James Eugene.....	N. Y.	1011 K Street.
Daniels, Richard Duvall.....	D. C.	1133 Newton Street, Brookland, D. C.
Davidson, William Falconer.....	N. C.	1226 Evarts Street, N. E.
Davis, Raymond Tilton.....	Md.	509 3d Street.
Dodson, James Dunbar.....	D. C.	1714 F Street.
Donk, Marion Gilbert.....	Fla.	Y. M. C. A.
Dougherty, Howard Francis.....	Md.	1012 12th Street.
Dwyer, John Rochford.....	D. C.	628 F Street, S. W.
Dyson, Arnold Horton.....	R. I.	1919 35th Street.
Fenton, John Wyckoff.....	D. C.	1508 9th Street.
Garvin, Edgerton Chester.....	Ohio	G. W. U.
Gillespie, Franklin Stuart.....	Pa.	34 8th Street, N. E.
Harrington, George Leavitt.....	Minn.	916 C Street, S. E.
Hartley, Harry Carter.....	Ill.	1414 11th Street.
Hill, Hugh Stewart.....	Wyo.	815 11th Street, N. E.
Himelfarb, Abraham, Jr.....	Md.	1024 1st Street, S. E.
Hoffman, Edwin S.....	Pa.	523 B Street, N. E.
Hough, Roland P.....	Va.	3301 Prospect Ave.
Howland, Charles Alpha.....	D. C.	1429 Belmont St.
Hursey, John Stealey.....	D. C.	1815 U Street.

Name.	Legal residence.	City address.
King, Edwin Houghtman.....	D. C.	1321 M Street.
Lawrence, Glenn Rupert.....	D. C.	3425 14th Street, Brook- land, D. C.
McInturff, Carleton	Va.	The Melton.
McPike, Martin John.....	Penn.	812 1st Street.
Magruder, Marshall	D. C.	1831 S Street.
Manville, Loren Robert.....	S. D.	The Sherman.
Mindeleff, Victor, Jr.....	D. C.	1042 29th Street.
Molitor, David Albert.....	Wisc.	827 Mills Bldg.
Moody, Theodore Lyman.....	Md.	1512 P Street.
Nichols, Charles Henry.....	Wash.	302 C Street.
Padgett, Harold Dement.....	Md.	U. S. Geological Survey.
Petersen, George Henry.....	D. C.	1647 Columbia Road.
Potter, Charles Hollister.....	N. C.	50 V Street.
Rockwell, Horace Lewis.....	D. C.	31 S Street.
Rodgers, William Joyce.....	D. C.	932 C Street, S. W.
Rouzer, Horace Dodge.....	Md.	753 E Street, S. E.
Saum, Irving Randolph.....	D. C.	1308 Girard Street.
Senior, Thomas Richard.....	D. C.	203 Elm Street.
Simpson, John Bogley.....	D. C.	925 E Street, N. E.
Smith, Harry Locke.....	N. H.	313 S Street, N. E.
Stuwe, John Daniel.....	Minn.	1017 P Street.
Topham, James Scott.....	D. C.	43 U Street, N. W.
Turkenton, William James.....	D. C.	1513 33d Street.
Walters, Henry Neal.....	Va.	Langley, Va.
Wanner, Howard Paul.....	Pa.	Hotel Stratford.
Warren, Frank Eugene.....	Md.	1218 9th Street.
Waters, Joseph Henry.....	D. C.	3227 11th Street.
Whiting, Julian Wythe.....	Md.	Rockville, Md.
Whiting, Louis Wine.....	Md.	Hyattsville, Md.
Yates, Robert Raleigh.....	D. C.	1608 6th Street.

Bachelor of Science in Electrical Engineering.

Bean, George Tinny.....	D. C.	312 Randolph Pl., N. E.
Blanco, Enrique Tomas.....	P. R.	919 G Street.
Bond, Rolf Wallace.....	D. C.	3127 Newark Street, Cleveland Pk., D. C.
Butts, Lorenzo Gould.....	Va.	National Electric Signal- ling Co.
Call, Loren Heinlein.....	D. C.	1448 Newton Street.
Church, Clarence Clinton.....	D. C.	626 North Carolina Ave.
Daniels, Ara Marcus, Jr.....	D. C.	The Portner.
Easterday, George Winship.....	D. C.	1681 31st Street.
Eigelberner, Jesse.....	Pa.	2026 G Street.

Name.	Legal residence.	City address.
Engle, Walter Morse.....	N. D.	1713 G Street.
Fehr, J. Ralph.....	Ill.	Bureau of Standards.
Fleming, Robert Fleming.....	D. C.	1847 Wyoming Ave.
Freeman, Louis George.....	D. C.	1700 Columbia Road.
Fuchs, Henry	Mo.	912 23d Street.
Gordon, Hayner Haskell.....	Ohio	1310 Girard Street.
Gourley, George Frederick.....	Md.	U. S. Pension Agency.
Gunning, James McIntosh.....	N. J.	122 East Capitol Street.
Gwinn, Thomas R.....	D. C.	1216 Connecticut Ave.
Honn, Harlan Verne.....	D. C.	1118 12th Street, N. E.
Johnson, Arthur Edward.....	Conn.	State, War, and Navy Building.
Law, Joseph Edward.....	D. C.	1627 14th Street.
Le Due, Henry Sumner.....	D. C.	817 Varnum Street.
Magers, James Ellsworth.....	Ill.	812½ 11th Street, N. E.
Nickel, William Frederick.....	Md.	382 Patent Office.
O'Connell, Martin Joseph.....	Pa.	2126 1st Street.
Parry, William	Pa.	1919 G Street.
Parsons, John	Ky.	Dept. Commerce and Labor.
Pierce, James Francis.....	Mich.	1243 5th Street.
Plass, Joseph.....	Germany ..	226 4th Street.
Richard, Vernon Irving.....	D. C.	309 B Street, N. E.
Rose, Karl	S. D.	1327 Monroe Street, Brookland, D. C.
Scott, Oliver Hazard Perry.....	S. C.	3207 11th Street.
Stabler, Harold Brooke.....	Md.	The Regina.
Sterrett, John Adlum.....	D. C.	Springland, Pierce Mill Road, D. C.
Turnburke, Vernon Palmer.....	D. C.	403 P Street.
Uhler, Alfred Griffith.....	Va.	Alexandria, Va.
Veihmeyer, Frank	D. C.	438 10th Street, S. W.
Ward, Philip Henry, Jr.....	D. C.	1756 Pa. Ave.
Webster, George Gerald.....	D. C.	5405 7th Street.
Wenderoth, Ernest Ferdinand.....	N. Y.	Bureau of Standards.

Bachelor of Science in Mechanical Engineering.

Acker, Kemp Gerard.....	D. C.	913 16th Street.
Ball, Eugene Maurice.....	D. C.	3020 Dent Place.
Burrell, William Webster.....	Pa.	417 Massachusetts Ave.
Carty, Roy Franklin.....	D. C.	Bureau of Standards.
Clothier, Albert Lea.....	Ky.	2002 G Street.
Espe, Theodore Nikolá.....	Iowa	Y. M. C. A.
Gary, Howland R.....	Va.	Ordnance Drafting Rm., Navy Yard.

Name.	Legal residence.	City address.
Gibson, Harry C.	Pa.	Bureau of Standards
Hough, Edgar Joseph	D. C.	472 Maryl'd Ave., S. W.
Jenkins, Oliver Lloyd	Ind.	413 A Street, S. E.
Lorando, Stephen Thomas	D. C.	1518 31st Street.
Miller, Elton Willard	Calif.	1825 1st Street.
Munroe, Russell Barker	D. C.	1337 21st Street.
Pipes, Walter Logan	D. C.	916 T Street.
Poole, George	D. C.	903 E Street, S. E.
Schaaf, August H.	Md.	Bureau of Standards.
Stafford, Charles F.	N. Y.	122 East Capitol Street.
Watkins, Francis Benjamin	D. C.	1626 S Street, N. W.

Special.

Beadle, John Bookwalter	D. C.	305 B Street, S. E.
Boshard, John Albert	Utah	1338 H Street.
Brame, Arthur Hervey	D. C.	1317 10th Street.
Carpenter, Essex Porter	D. C.	1921 G Street.
Curtis, William Barnard	Md.	Lenox Street, Chevy Chase, Md.
DeRiemer, Arthur Hyde	Ill.	1461 Chapin Street.
Gallagher, George Domonic	D. C.	413 K Street, N. E.
Hardester, John Sylvester	D. C.	529 12th Street, S. E.
Hendley, Albert Julian	D. C.	The Plymouth.
Humphreys, John Thomas	D. C.	718 8th Street, N. E.
Kenyon, Archie G.	Pa.	611 22d Street.
Kirkland, Thornton Crowns	Mexico	3615 Newark Street, Cleveland Pk., D. C.
Kramer, Frank Henry	D. C.	815 3d Street, S. E.
Lasley, Dana McGuffey	D. C.	The Albemarle.
Lescallett, John Abram	Md.	Glendale, Md.
Licarione, Alexander	D. C.	417 12th Street, S. E.
Lindenkohl, Ludwig	Md.	26 Grant Place.
McConnell, Harry Raymond	Va.	438 Kentucky Ave., S. E.
Mattingly, Gentry Heard	D. C.	475 F Street, S. W.
Moore, Arthur Allston	Md.	427 Monroe Street, Anacostia, D. C.
Piper, Edgar Raymond	D. C.	The Plymouth.
Shannon, Thomas Louis	Pa.	U. S. S. Puritan.
Smith, Chester Harvey	D. C.	327 2d Street, N. E.
Stump, William Gilpin Harrison	D. C.	The Cumberland.
Sutton, Edward	D. C.	138 Massachusetts Ave., N. E.
Zirkle, Joseph Claiborne	Va.	1221 10th Street.

ARCHITECTURE.

Bachelor of Science in Architecture.

Name.	Legal residence.	City address.
Baker, Josephine Rose.....	Md.	Hyattsville, Md.
Daly, Aubrey Truitt.....	D. C.	1311 Rhode Island Ave.
Doyle, Burton Jarvis.....	D. C.	632 C Street, N. E.
Holmes, Osgood	D. C.	1444 Belmont Street.
Holzberg, Tonnis Julius.....	D. C.	3019 Dumbarton Ave.
Illman, Hubert Percy.....	Pa.	1528 10th Street.
Lombard, Charles Russell.....	Me.	503 Spruce Street.
McAuley, Hugh Nisbet.....	D. C.	530 21st Street.
Sullivan, Francis Paul.....	D. C.	1823 U Street.

A.B., 1904, Georgetown University.

Special.

Bachschmid, Ernst Christian.....	D. C.	310 B Street, N. E.
Berryman, George Rue.....	Va.	1311 Q Street.
Blasey, Joseph	D. C.	214 Arthur Place.
Buckingham, Nevell	D. C.	134 C Street, N. E.
Burnham, Brooke Browning.....	D. C.	103 C Street, S. E.
Childs, George Singleton.....	Md.	1825 I Street.
Dysland, Henry Theodore.....	Wisc.	320 Maryland Ave., N. E.
Emmert, Percival Dobbins.....	D. C.	1845 Wyoming Ave.
Galloway, Gerald F.....	England ...	The Olympia.
Garland, Alexander, Jr.....	Peru	Peruvian Legation.
Geare, Reginald Wickliffe.....	D. C.	1318 Columbia Road.
Greenberg, Louis	D. C.	612 N Street.
Holmes, Walter	Pa.	2417 18th Street.
Humphrey, Harry Baxter.....	Oregon ...	The Bachelor.
Jackson, Henry Edmond.....	Va.	2405 18th Street.
Jones, Philip Craig.....	D. C.	701 East Capitol Street.
Knowles, William Alexander.....	Md.	National Museum.
Koetz, Peter	Pa.	1303 U Street.
Langille, Louis E.....	D. C.	Takoma Park, D. C.
Lockie, Joseph Alexander.....	Me.	1601 O Street.
Merwin, Charles Merrill.....	N. J.	917 Westminster Street.
Ray, George Nicholas.....	D. C.	2323 1st Street.
Roberts, Thomas Kent.....	Md.	1901 2d Street.
Steward, Willard Moore.....	D. C.	2127 1st Street.
Thatcher, Marion	Mich.	1754 Q Street.
Wagner, Simon Peter.....	Md.	1330 13th Street.

TEACHERS COURSES.

Æsthetica.

Name.	Legal residence.	City address.
Gardner, Marian	D. C.	1215 Irving Street.
Heath, Louise	D. C.	617 Florida Ave.
Newhouser, Bertha G.	Pa.	217 East Capitol Street.
Turner, M. Elsie.	D. C.	414 B Street, N. E.
Wallace, Sarah Agnes.	D. C.	3021 Newark Street.
West, Sara A.	D. C.	3014 13th Street.
White, E. J.	D. C.	G. W. U.

Archæology.

Flannery, Mary Philomena.	D. C.	1600 1st Street.
Lamborne, Sarah	D. C.	1510 S Street.
Raymond, Katherine Green.	D. C.	1521 Vermont Ave.

Architecture.

Atlee, Anna May.	D. C.	1322 S Street.
Burroughs, Lillian O.	N. J.	515 7th Street, S. E.
Chester, Lilly A.	D. C.	1330 12th Street.
Concklin, Alice Elizabeth.	D. C.	513 11th Street.
Guillaume, Bertha	D. C.	1412 11th Street.
Hungerford, Frances	D. C.	The Ethelhurst.
North, Hilda	D. C.	2807 14th Street.
Richards, Ruth Bergman.	D. C.	101 Massachusetts Ave., N. W.

Biblical Literature.

Bradshaw, May Pual.	D. C.	901 C Street, N. E.
Carpenter, Lillian	D. C.	205 D Street, N. E.
Fernald, Julia P.	D. C.	206 6th Street, N. E.
Greene, Olive Wirt.	D. C.	12 I Street, N. E.
Stewart, Mary	D. C.	2017 H Street.
North, Hilda	D. C.	2807 14th Street.

Botany so.

Johnston, Margaret Anne.	D. C.	1633 Irving Street.
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Comparative Biology.

Bogan, Rose Mary.	D. C.	606 Massachusetts Ave.
Gibbs, Kate Maria.	Mass.	1216 S Street.
Greenwood, Mary Maud.	Md.	1211 Montello Av., N. E.
Haslup, Alice Elma.	D. C.	205 9th Street, S. W.

Name.	Legal residence.	City address.
Hilleary, Clara Louise.....	D. C.	3314 P Street.
Hilleary, Mary Beatrice.....	D. C.	3314 P Street.
Jacobs, Emma Suter.....	D. C.	1407 10th Street.
Lamson, Elizabeth H.....	D. C.	2439 18th Street.
Woodward, Esther R.....	D. C.	125 New York Ave.

Constitutional Law.

Beller, Lizzie Caroline.....	D. C.	235 1st Street, N. E.
Connell, Lillie Marie.....	D. C.	610 New Jersey Ave.
Cook, Florence M.....	D. C.	607 Howard Place.
Dilger, Mary A.....	Penn.	222 New Jersey Ave.
Higgins, Elizabeth A.....	D. C.	101 North Carolina Ave., S. E.
Jayne, Mattie Filer.....	Va.	1322 W Street.
Lowe, Henry Francis.....	D. C.	215 5th Street, N. E.
Monahan, Margaret Florence.....	D. C.	101 North Carolina Ave., S. E.
Rowe, Effie F.....	D. C.	136 C Street, S. E.
Westcott, Edith C.....	D. C.	1317 Riggs Place.
Young, Irene O.....	D. C.	904 New York Ave.

English.

Burden, Edith	D. C.	1309 Riggs Street.
Burden, Katherine	D. C.	1309 Riggs Street.
Doing, Jennie E.....	D. C.	2036 F Street.
Alden, A. Grace.....	D. C.	809 L Street.
Fant, Jessie Du Bois.....	D. C.	321 A Street, S. E.
Fitzgerald, Louise	D. C.	1804 S Street.
Galiher, Blanche P.....	D. C.	436 6th Street, N. E.
Haslup, Alice Elma.....	D. C.	205 9th Street, S. W.
Heath, Louise	D. C.	617 Florida Ave.
Howell, Blanche Braxton.....	D. C.	724 10th Street, N. E.
Maloney, Amma J.....	Ill.	1902 Vermont Ave.
Marshall, E. Blanche.....	Md.	635 East Capitol Street.
Meyers, Minnie Matilda.....	D. C.	1319 Irving Street.
Smith, Janie Alice.....	D. C.	637 Massachusetts Ave., N. E.
Tennyson, J. Anna.....	D. C.	224 8th Street.
Underwood, Harriet	N. Y.	3223 N Street.
Van Doren, Emma May.....	D. C.	620 Massachusetts Ave., N. E.
Walker, Alberta	D. C.	1133 24th Street.
Wanstall, Laskey Mary.....	D. C.	

Geology.

Name.	Legal residence.	City address.
Breen, Mary Cecelia.....	D. C.	1357 U Street.
Sipe, Susan Bender.....	D. C.	The Ontario.
Whitney, Cornelia	D. C.	47 D Street, S. E.

History.

Barnard, Caroline Fanning.....	D. C.	2012 1st Street.
Bentley, Loleta A.....	D. C.	1317 Riggs Street.
Blandford, Nannie	D. C.	200 8th Street, S. W.
Church, Grace E.....	D. C.	626 North Carolina Ave., S. E.
Coale, Christine	D. C.	667 South Carolina Ave., S. E.
Dillon, Agnes B.....	D. C.	Cleveland Park.
Freeman, Alice Lavinia.....	D. C.	734 5th Street.
Green, Elsie Eugenia.....	D. C.	600 23d Street.
Lasier, Harriet C.....	D. C.	1427 Girard Street.
Mason, Josephine Dwight.....	Mass.	132 A Street, N. E.
Robey, Mabel Alida.....	Md.	Hyattsville, Md.
Sisson, Abbie Mills.....	D. C.	1804 1st Street.
Smith, Clara Louise.....	D. C.	327 2d Street, N. E.
Walsh, Helen I.....	D. C.	The Mt. Pleasant.
Sliney, R. L.....	D. C.	1428 Clifton Street.

Sociology.

Campbell, Ida May.....	D. C.	1918 13th Street.
Clark, Mary Stiles.....	Md.	R. F. D., No. 3, Silver Springs, Md.
Draper, Henry White.....	D. C.	1810 S Street.
Golden, Ellen	D. C.	The Portner.
Little, Agnes Inch.....	D. C.	332 Maryl'd Ave., N. E.
Littlejohn, Alice	D. C.	308 F Street.
Lockwood, Jane Girvan.....	Va.	1st & B Streets, S. W.
Macgee, Lottie Pell.....	D. C.	2211 I Street.
Newhouser, Enola H.....	Penn.	127 East Capitol Street.
Orr, Clem. Winnie.....	D. C.	1109 Spring Street.
Simons, Sarah Emma.....	D. C.	1420 N Street.
Thönssen, Ruby Ella.....	D. C.	315 C Street, S. E.
Tompkins, Lida R.....	D. C.	1881 3d Street.
Weddell, Mary	Va.	915 M Street.
Westcott, Edith C.....	D. C.	1317 Riggs Place.
Young, Irene O.....	D. C.	904 New York Ave.

Summary.

GRADUATE STUDIES:

Candidates for the M.A. degree.....	11
Candidates for the M.S. degree.....	9
Candidates for the Ph.D. degree.....	45
In attendance	9
	— 74

COLUMBIAN COLLEGE:

Candidates for the B.A. degree.....	85
• Candidates for the B.S. degree.....	42
Candidates for the B.S. in Politics degree.....	2
Candidates for the B.S. in Chemistry degree.....	13
Special	75
Auditor	1
	— 218

WASHINGTON COLLEGE OF ENGINEERING:

Candidates for the B.S. in C.E. degree.....	57
Candidates for the B.S. in E.E. degree.....	40
Candidates for the B.S. in M.E. degree.....	18
Special	26
	— 141

ARCHITECTURE:

Candidates for the B.S. in Architecture degree.....	9
Special	26
	— 35

TEACHERS' COURSES:

Æsthetics	7
Archæology	3
Architecture	8
Biblical Literature	6
Botany 20	1
Comparative Biology	9
Constitutional Law	11
English	19
Geology	3
History	15
Sociology	16
	— 98
Total	566

FACULTY OF MEDICINE.

DEPARTMENT OF MEDICINE.

Doctor of Medicine.

Name.	First Year.	Legal residence.	City address.
Amoss, Harold Lindsay.....	Ky.	.....	5 Iowa Circle.
B.S., 1905, Kentucky State College.			
Chartters, George Chancellor.....	Va.	.....	1335 H Street.
Derrick, Willie Smelzer.....	Miss.	.....	811 Vermont Ave.
Downey, Alice Winans.....	D. C.	.....	2473 18th Street.
Davis, George Pullinger.....	D. C.	.....	1307 9th Street.
Duennen, Robert Henry.....	Tenn.	.....	815 12th Street.
Dulaney, Fred	Tenn.	.....	G. W. U.
Elliott, Leo Louis.....	N. Y.	.....	1317 8th Street.
Fearing, Henry Martin.....	N. C.	.....	1412 I Street.
Fetzer, Lewis William.....	N. Y.	.....	1550 3d Street.
Grad. Chem., 1900, Cooper Institute, N. Y.			
French, Frank Vernon.....	Idaho	.....	210 A Street, S. E.
Gibson, John Latimon.....	D. C.	.....	607 6th Street.
Goss, Audrey	Kansas	.....	Gov. Hospital for Insane.
A.B., 1902, Kansas University.			
Herring, Katherine Mary.....	Iowa	.....	The Savoy.
Hoover, George William.....	Okla.	.....	1472 Clifton Street.
M.S., 1906, The George Washington University.			
Hornaday, Frank Adelbert.....	Texas	.....	232, P. O. Building.
Huntington, William Henry.....	D. C.	.....	2330 Massachusetts Ave.
Jewell, Benson Mundy.....	Ill.	.....	716 19th Street.
Kemeys, William	D. C.	.....	1633 29th Street.
Kisseleff, John	D. C.	.....	1030 North Capitol St.
Lewis, Harry Samuel.....	D. C.	.....	54 I Street.
Loop, Floyd Addison.....	Pa.	.....	1529 10th Street.
McLoone, John Joseph.....	Pa.	.....	717 H Street.
A.B., 1905, Catholic University.			
Phar.D., 1904, National College of Pharmacy.			
McMillan, Walter Alexis.....	S. C.	.....	1220 I Street.
Medley, Thomas Charles.....	La.	.....	1109 13th Street.
Middleton, Rankin York.....	D. C.	.....	22 Seaton Street, N. E.
Morian, Clarence Herbert.....	Pa.	.....	914 12th Street.
Nelson, Nesmith	Minn.	.....	Auditor for P. O. Dept.
Norris, James Walter.....	Md.	.....	514 3d Street.
Neville, James Alan.....	Nebr.	.....	1829 G Street.
Paige, Wendell Arthur Heath.....	Vt.	.....	1602 Vermont Ave.
Peyton, Harry Alexander.....	Pa.	.....	1744 Riggs Place.

Name.	Legal residence.	City address.
Price, Walter	D. C.	438 New Jersey Ave., S. E.
Ross, Erwin Worth	N. C.	1516 K Street.
Rougeou, Charles F.	La.	515 F Street.
Ryan, Fred Nadenbousch	D. C.	1301 Corcoran Street.
Scanlon, Franklin Taylor	W. Va.	1903 G Street. B.L., 1904, University of Nashville.
Sharp, George Tarplit	D. C.	Cleveland Park, D. C.
Silberstrom, Paul	Russia	3d and H Streets, S. E.
Sinclair, Leith Llewellyn	Va.	327 M Street, S. E.
Sorrell, Clarence Holden	D. C.	244 8th Street, S. E.
Tibbets, Albert Perkins	N. H.	1018 14th Street.
Titus, Elijah White	Va.	1219 Otis Place. Phar.D., 1906, The George Washington University.
Vierra, George Washington	Hawaii	716 19th Street.
Waller, Clifford E.	D. C.	R. F. D., No. 3, Benning, D. C.
White, Lyle Charles	Ohio	1211 North Capitol St.
Wolfram, Philip Herman	Ill.	1137 12th Street.
Young, Clifton Eugene	D. C.	2509 Wisconsin Ave.

Second Year.

Anderson, Paul	Ill.	716 19th Street.
Asbell, Mellege Shaw	S. C.	1322 Rhode Island Ave. A.B., 1901, Wofford College, S. C.
Bales, Ernest Norment	Calif.	Washington Asylum Hospital. Ph.G., 1903, Ohio Institute of Pharmacy.
Brooks, James Joseph Lester	Pa.	465 Florida Ave.
Chappell, Sidney Lovett	D. C.	Tenleytown, D. C.
Clark, Albert Patton	D. C.	1217 Harvard Street. Phar.D., 1905, National College of Pharmacy.
Collins, James Cleveland	Va.	1142 6th Street.
Conklin, Rush West	Pa.	Government Printing Office.
Craft, Clarence Christian	S. C.	1116 10th St. B.S., 1902, S. C. Military Academy.
Dunn, Abner Beebe	Pa.	1335 H Street.
Eldridge, Watson William, Jr.	Md.	316 Maryland Ave., N. E.
Fair, Charles Hardy	Va.	732 21st Street.
French, Sanford Williams	N. Y.	U. S. S. Puritan.
Frey, John Paul	D. C.	1224 30th Street.
Glennan, Kenneth Rayner	Md.	Chevy Chase, Md.

Name.	Legal residence.	City address.
Gochenour, David Thomas.....	Va.	28 R Street.
Bach. Eng, Bridgewater College.		
Griffin, Clarence Herbert.....	Mass.	1337 Columbia Road.
B.S., 1904, Massachusetts Agricultural College.		
Hoey, John Joseph.....	R. I.	1825 H Street.
Jobson, William Russell.....	Pa.	Y. M. C. A., Room 440.
Kavanagh, James Edward.....	Mass.	1431 Q Street.
Keneipp, Edgar Percy.....	Ill.	136 D Street, S. E.
Kinner, Jesse Lee.....	N. Y.	1317 8th Street.
Klugh, George Fred.....	S. C.	Bureau of Plant In-
B.S., 1901, Clemson Agricultural College.		
Lind, John Edward.....	D. C.	1355 Maryland Ave.,
N. E.		
McEnery, Douglas Wiltz.....	La.	1412 I Street.
B.A., 1903, Tulane University.		
McKnight, Frederick W.....	Ohio.	1314 11th Street.
McLaughlin, William Frank.....	Pa.	Emergency Hospital.
Mann, Victor Llewellyn.....	Mich.	2 Iowa Circle.
Michelsoni, Louis Antony.....	Uruguay ..	1220 G Street.
Morris, Horace	Ky.	1411 Corcoran Street.
Nelson, Cyrus William.....	Okla.	Indiana Ave. and 1st St.,
N. W.		
B.S. in Chem., 1903, Oklahoma Agricultural and		
Mechanical College.		
Phar.D., 1906, National College of Pharmacy.		
Orrison, Lloyd Foster.....	Va.	Mount Vernon Flats.
Pole, Samuel Boyce Pole, Jr.....	D. C.	216 8th Street, N. E.
Powell, Robert Llewellyn.....	Va.	934 O Street, N. W.
Rhees, Benjamin Rush.....	D. C.	1853 Ontario Place.
Rock, George Roscoe.....	N. J.	The Seward.
Russell, Riley	Ill.	2 Iowa Circle.
Simonton, Lawrence Joseph.....	Ind.	1451 Rhode Island Ave.
Sisco, Henry Nathaniel.....	D. C.	1602 Vermont Ave.
A.B., 1898, Battle Creek College.		
Sorensen, Antone Christian.....	Utah	1130 12th Street.
Teeter, Frank Irvin.....	Mo.	617 H Street.
Vasenius, Fredrick Walter.....	Finland ..	2 Iowa Circle.
Weiler, George Leo.....	Utah	814 B Street, N. E.
Willis, Harry Clay.....	N. C.	932 K Street.
Willis, John Mitchell.....	W. Va.	1110 New York Ave.
Wood, William Pleasant.....	Ohio	231 7th Street, N. E.

Third Year.

Name.	Legal residence.	City address.
Avery, Frederick Scott.....	Mich.	1460 Corcoran Street.
Bowers, John Edson.....	Ind.	23 C Street, N. E.
Brown, Frank J.....	Iowa	49 T Street.
Browning, Andrew Johnson.....	Md.	Y. M. C. A.
Bryan, William Alvin.....	Iowa	U. S. Capitol.
Dunmire, Roy Franklin.....	Penn.	133 10th Street, N. E.
Everett, Ernest D.....	Mo.	23 Q Street, N. E.
A.B., 1899, Baker University		
Frazier, Frank Eugene.....	Wis.	3012 11th Street.
Garnett, Algernon Sydney.....	Va.	Sibley Hospital.
Gehring, George Matthew.....	Penn.	1121 15th Street.
Griffith, Thomas Everett.....	Penn.	718 4th Street, S. E.
Hart, George H.....	Penn.	1516 K Street.
V.M.D., 1903, University of Pennsylvania.		
Higgins, Daniel W., Jr.....	Md.	146 11th Street.
Hopkins, John Wilson.....	Minn.	1335 H Street.
Horgan, Edmund Joseph.....	D. C.	1167 19th Street.
Irbysmith, William Marion.....	Ky.	1111 17th Street.
A.B., 1901, A.M., 1901, Georgetown College, Ky.		
Lawrence, Charles Solomon.....	N. C.	Columbia Hospital.
Littlefield, John Ramsey.....	D. C.	Emergency Hospital.
MacKnight, Robert Stanley.....	Mich.	5508 Wisconsin Ave.
Maxwell, Maurice Hopkins.....	Md.	Sibley Hospital.
McLean, Frank	D. C.	735 13th Street.
Meyer, Henry Adolph.....	Pa.	212 8th Street, S. E.
Molzahn, Herman E.....	Minn.	1017 P Street.
Neate, John Sweyn.....	D. C.	3009 Dumbarton Ave.
Noyes, Edward Rogers.....	D. C.	1014 S. C. Ave., S. E.
Ong, Harry Alfred.....	Ohio	917 S Street.
Patterson, Orra Edgar.....	Ill.	1012 17th Street.
Pyne, Herbert Samuel.....	Utah	915 M Street.
Quick, Ralph Andre.....	Va.	University Hospital.
Sherwood, John Wesley.....	Md.	156 11th Street, N. E.
Simons, Harry Emmerich.....	D. C.	212 A Street, S. E.
Smith, Ernest Wellington.....	W. Va.	1825 F Street.
Tayloe, Harry Marbury.....	Va.	1111 17th Street.
Taylor, Edward	Ala.	1013 P Street.
B.S., 1903, in Pharmacy, Alabama Polytechnic Institute.		
Tewksbury, William Davis.....	Colo.	Barne's Hospital.
Thompson, Lewis Royer.....	Penn.	801 New Jersey Ave.
B.A., 1900, Ursinus College.		

Name.	Legal residence.	City address.
Turnbull, Samuel Jay.....	Fla.	1103 H Street.
Weber, Frederick Clarence.....	Ohio	121 Md. Ave., N. E. B.S., Ohio State University.
Weidemann, Clarence Conrad....	D. C.	1237 Girard Street.
Weithas, Richard C.....	N. Y.	General Land Office.
Wheatley, Charles	Md.	Bethesda, Md.
Wheeler, Arthur Joseph.....	Ill.	119 E Street, S. E.
Wilhelm, Joseph	Ill.	Room 362, Navy Dept.
Williams, Richard Theodore....	D. C.	1319 8th Street.
Wolfe, James Thruston.....	Va.	815 15th Street.
Wolfe, Rowland Daniel.....	Md.	1335 H Street.

Fourth Year.

Barnesby, Walter Raleigh.....	Ill.	The Brunswick.
Beistel, Matthew John.....	Mich.	708 Massachusetts Ave., N. E.
Biggs, Joseph Rozier.....	D. C.	1809 Riggs Place.
Bogan, Joseph Borrows.....	D. C.	606 Massachusetts Ave.
Bower, Charles Franklin.....	S. D.	Y. M. C. A.
Boyd, William Alexander.....	N. C.	The Plymouth.
Bryson, Herbert James.....	Pa.	714 12th Street, N. E. A.B., 1903, Columbian University.
Burket, Clare William.....	Pa.	1519 Kingman Place.
Carr, William Brown, Jr.....	D. C.	1418 L Street.
Carter, Paul Irving.....	Calif.	1418 L Street.
Chapman, John Madison.....	Md.	Department of Justice.
Chipman, Cline N.....	Ky.	The Plaza.
Clark, Roy Manning.....	Mich.	1231 11th Street.
Cliff, Benjamin F.....	N. C.	1400 L Street.
Compton, Arthur George.....	D. C.	Children's Hospital.
Conklin, Coursen Baxter.....	D. C.	University Hospital.
Coster, Leonard Martin.....	D. C.	813 East Capitol Street.
Cuthbertson, Charles Wesley....	D. C.	309 7th Street. D.D.S., 1900, Columbia University.
Darnall, Moses Hubbard.....	Texas	1618 15th Street.
Dewey, Christian Henry.....	Ill.	32 Seaton Street. Master of Accta, 1904, Western Normal College.
Dollman, Clarence Mazarine....	Va.	1000 N Street.
Emery, James Armitage.....	Md.	60, The Olympia.
Garton, Alfred Clark.....	Ind.	Dept. of Agriculture.
Grant, Charles Vincent.....	Pa.	The Coywood.
Grant, John Lee.....	Va.	1234 Duncan Street, N. E.
Hailman, Hubert Victor.....	Va.	301 C Street.

Name.	Legal residence.	City address.
Hankemeyer, Nathaniel William.	Mass.	1223 N Street.
A.B., 1885, Iowa Wesleyan.		
B.D., 1890, Chicago Theological Seminary.		
Harrison, Charles Alben.	Ill.	1335 H Street.
Hart, John White.	Mass.	220 4th Street, S. E.
Hartley, Clarence A.	Ind.	607 4th Street.
Haywood, John Kerfoot.	N. Y.	Dept. of Agriculture.
B.S., 1896, Cornell University.		
Hoberman, Samuel	N. J.	1105 K Street.
Holmes, Robert Ward.	N. H.	215 Florida Ave.
Howlett, Howard Henry.	La.	1313 Wallach Place.
Johnston, Henry Vernon.	D. C.	University Hospital.
Kearney, Henry Walper.	Va.	1530 O Street.
Kelleher, Jeremiah Edward.	Mass.	930 I Street.
Kline, Lane Bruce.	Va.	803 8th Street.
Lamkin, Joseph Bayard.	Ga.	216 New York Ave.
Lee, Thomas Alexander, Jr.	D. C.	1755 Church Street.
Levy, William Victor.	N. J.	8 B Street, N. E.
McConnell, James Henry.	N. Y.	314 N. C. Ave., S. E.
McKee, Charles Bradford.	Calif.	Y. M. C. A.
Mess, William Adam.	Ind.	Garfield Memorial Hos- pital.
Monk, Frederick Hinton.	N. Y.	1109 14th Street.
Morris, Roy Thomas.	D. C.	1209 O Street.
Moser, William Calvert.	Pa.	1221 New York Ave.
Nielson, Alexander J.	Utah	512 B Street, N. E.
Phillips, Orlyn Sargent.	Nebr.	73 Seaton Street.
Rector, Frank Leslie.	Okla.	132 A Street, N. E.
B.S., 1902, Agricultural and Mechanical College, Oklahoma.		
Ryan, Bernard St. Elmo.	Va.	1301 Corcoran Street.
Sacks, Samuel	D. C.	Children's Hospital.
Schapiro, Louis	Wisc.	1205 11th Street.
Smith, Joseph Allen.	N. D.	1031 K Street.
Smith, Thomas Francis.	Fla.	1116 New York Ave.
Stephenson, Eugene Theodore.	Texas	1124 E Street, N. E.
Stetson, Thomas	D. C.	Nat'l Safe Deposit Sav- ings and Trust Co.
Stout, Henry Isaiah.	D. C.	U. S. Jail.
Tastet, David Walker.	D. C.	265 N Street.
Terry, Philip Roy.	La.	706 11th Street.
Thomas, William Joshua Groot.	D. C.	1541 9th Street.
Titus, Stanley Herbert.	Wash.	The Plymouth.
Tomlin, Timothy Harrington.	Mo.	1009 B Street, N. E.
van Casteel, Gerald.	Md.	320 Bond Building.
LL.B., 1899, LL.M., 1900, Georgetown University.		
Wallace, Clifton Robert.	Va.	413 Mills Building.

Name.	Legal residence.	City address.
Waring, John Brockenbrough		
Harvie	Va.	1830 Oregon Ave.
Warner, Harry J.	Ill.	2021 H Street.
B.S., 1901, University of Illinois.		
Warner, Willis Henry.....	Mich.	2 Iowa Circle.
Watson, Charles Lyman.....	D. C.	2024 G Street.
Whamond, Frederick Gordon.....	Ill.	1234 Duncan St., N. E.
White, Eben Wesley.....	N. Y.	1504 Vermont Ave.
Wileox, Horace Leroy.....	Pa.	2610 University Place.
Willets, David Gifford.....	N. J.	1530 O Street.
Ph.B., 1902, Wesleyan University.		
Wilson, Edward Comstock.....	N. Y.	1318 Park Road.
Yates, Robert Jackson.....	Va.	1300 Pennsylvania Ave.
L.L., 1894, William and Mary College.		

Special.

Dohson, William Hervie.....	China	118 11th Street, N. E.
M.D., 1895, Columbian University.		
Heiner, Robert Graham.....	D. C.	2119 O Street.
Owen, William Otway.....	D. C.	No. 1, Louisiana.
Prosperi, Augustus Grant.....	D. C.	The Newton.
Shaw, Harry Berry.....	D. C.	15 Maple Ave., Takoma
		Park, D. C.
Smith, Lucian Conway.....	Va.	801 Duke Street, Alex-
		andria, Va.
M.D., 1905, The George Washington University.		

Review.

Browne, Rhodric Winfield.....	Mass.	1618 3d Street.
M.D., 1905, The George Washington University.		
Kebler, Lyman Frederic.....	Penn.	1322 Park Road.
Ph.C., 1890, M.S., 1892, University of Michigan.		
M.D., 1906, The George Washington University.		
Smith, Lucian Conway.....	Va.	801 Duke Street, Alex-
		andria, Va.
M.D., 1905, The George Washington University.		
Trow, Walter Gordon.....	D. C.	912 East Capitol St.
M.D., 1905, The George Washington University.		

Summary.

CANDIDATES FOR THE M.D. DEGREE:

First year	48
Second year	46
Third year	46
Fourth year	75
Special	215
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DEPARTMENT OF DENTISTRY.

Doctor of Dental Surgery.

First Year.

Name.	Legal residence.	City address.
Barnhard, William Harry, Jr.....	Ohio	1124 10th Street.
Bear, Ewing Marvin Wood.....	D. C.	914 New York Ave.
Cannon, Claude Quayle.....	Utah	915 L Street.
Goldberg, Max Samuel.....	D. C.	627 D Street.
Harrison, William Sloane.....	S. C.	2021 H Street.
Hickman, Charles Taylor.....	Pa.	Dewey Hotel.
Irby, Charles Rufus.....	Va.	1335 H Street.
Marsh, Bradford Cleveland.....	R. I.	1339 Irving Street.
Stellner, George Martin.....	Ill.	U. S. Naval Hospital.

Second Year.

Addison, William Richard.....	Wisc.	500 G Street, N. E.
Angelo, Guy Wilson.....	Va.	1236 13th Street.
Bernhard, James Walter.....	Pa.	423 2d Street.
Boarman, Alan Smith.....	Md.	807 H Street.
Britton, Emlyn J.....	Pa.	Washington Barracks.
Bumpus, Albert Horace.....	Mass.	1321 11th Street.
Clark, Robert Henry.....	Ind.	Naval Medical School Hospital.
Cummings, Alfred William.....	Kansas	413 P Street.
Fairfield, Thomas Leon.....	D. C.	1224 F Street.
Gash, Arthur Wellesley.....	R. I.	517 6th Street.
Grubbs, John Alexander.....	Va.	413 P Street.
Helmig, Casper Florian.....	Mo.	Gov. Printing Office.
Higgins, Charles Millington.....	W. Va.	60 Randolph Place.
Hildreth, Walter Henry.....	N. Y.	1533 15th Street.
A.B., 1893, A.M., 1904, Amherst College.		
Hopkins, Herbert Cornwell.....	D. C.	1608 Monroe Street.
Houghtelin, William Clarence....	Kansas	1018 12th Street.
Johnson, Harry Dow.....	Mo.	U. S. Geological Survey.
Murdoch, Herbert Spencer.....	Miss	1131 10th Street.
Peck, George Francis.....	N. J.	1018 12th Street.
Smitten, George	D. C.	202 E Street.
Wilcox, Horace Leroy.....	Pa.	2610 University Place.
Young, Henry Cissel.....	Md.	1532 I Street.

Third Year.

Allen, Clyde William.....	S. D.	1000 M Street.
Davidson, Albert Sidney.....	Va.	119 Md. Ave., N. E.
Detmer, Charles Edwin.....	Mont.	1102 L Street.

Name.	Legal residence.	City address.
Eskin, Jacob Sidney.....	D. C.	619 Q Street.
Fred, Thomas William.....	Va.	1123 Euclid Street.
Handy, Joseph William.....	Mo.	807 10th Street.
Huneston, Andrew	Conn.	620 I Street.
Jackson, George Percival.....	N. Y.	1365 G Street, N. E.
Lawrence, William Francis.....	N. Y.	1025 10th Street, N. E.
Macdonald, Geo. Bertram Roper.....	D. C.	1115 G Street.
Martin, Francisco José.....	Costa Rica ..	513 6th Street.
Merritt, William Allison.....	D. C.	203 8th Street, N. E.
Murray, Fred Grant.....	D. C.	209 6th Street, N. E.
Pflug, Charles S.....	Utah	527 Mills Bldg., Annex.
Phillips, John Albert.....	Nebr.	73 Seaton Street.
Shea, James Edward.....	N. Y.	1317 8th Street.
Shoemaker, Charles Gardner.....	D. C.	3116 P Street.
Wood, James Frank.....	Mich.	30 Randolph Street.

Special.

Clinton, Ralph Stuart.....	N. Y.	Room 333, General Land Office.
D.D.S., 1906, The George Washington University.		
Woodruff, William Henry.....	D. C.	902 14th Street.
D.D.S., 1906, The George Washington University.		

Review.

Murphy, Don Francis.....	D. C.	2447 18th Street.
D.D.S., 1906, The George Washington University.		

Summary.**CANDIDATES FOR THE D.D.S. DEGREE:**

First year	9
Second year	22
Third year	18
Special	49
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DEPARTMENT OF LAW.**Bachelor of Laws.****First Year.**

Name.	Legal residence.	City address.
Aldrich, Charles Roberts.....	Ill.	1808 I Street.
B.A., 1903, Yale University.		
Anderson, Howard M.....	Ohio	1531 New Hampshire Av.
Arlitt, John Louis.....	Texas	2024 F Street.

Name.	Legal residence.	City address.
Barrick, Henry Llewellyn.....	Nebr.	1209 11th Street.
Biddle, Milton Scott.....	W. Va.	836 Venum Street.
Bigoness, Octave Adelbert.....	D. C.	56 Q Street, N. E.
Birney, William McDonald.....	D. C.	1516 22d Street.
Brandenburg, Joseph Franklin....	D. C.	915 French Street.
Brennan, John Ray.....	D. C.	The Astoria.
Briggs, Benjamin Franklin.....	Me.	Care of William F. White, Maryland Bldg
Burson, Edgar Farrall.....	Kansas	1334 B Street, S. E.
Carpenter, Walter Clayton.....	R. I.	Bureau of Standards. Ph.B., 1906, Brown University.
Caywood, Charles Chester.....	D. C.	1436 Newton Street.
Childs, Frederick Willard.....	Vt.	The Champlain.
Clark, Chester Morrow.....	D. C.	The Concord.
Cragin, Harry Seymour.....	D. C.	1013 L Street.
Curtis, William Barnard.....	Md.	Lenox Street, Chevy Chase, Md.
Dallwig, Paul	Wisc.	23 Iowa Circle.
Dalzell, Robert Duff.....	Pa.	1605 New Hampshire Ave.
A.B., 1905, Yale University.		
De Lancy, Roi.....	Ohio	1226 12th Street.
Doyle, Connie B.....	D. C.	1133 Lamont Street.
Estabrook, Frank, Jr.....	Idaho	1810 G Street.
Foer, Albert	D. C.	1640 6th Street.
Forsaith, Clarence S.....	N. H.	6 B Street, N. E.
Fosselman, John Jones.....	Pa.	2901 14th Street.
Gable, Charles Lewis.....	Pa.	807 H Street, N. W.
Gaines, John Wesley, Jr.....	Tenn.	1325 G Street.
Garrett, Clyde Davis.....	D. C.	945 O Street.
Gilbert, Francesco Bernard.....	Pa.	1327 G Street.
Gonzalez, Antonio Cornelius, Jr...	N. Y.	1417 K Street.
Graham, Lesley Stone.....	Pa.	2123 18th Street. B. Letters, 1906, Bethany College, W. Va.
Graves, Barak Thomas.....	D. C.	1236 13th Street.
Graves, Pleasant Fowler.....	Texas	510 A Street, N. E. Ph.B., 1905, Southwestern University.
Haselton, George Irving.....	N. H.	537 Massachusetts Ave.
Hemmick, Frank Schley.....	D. C.	1829 F Street.
Hester, Addison Reed.....	N. C.	1825 H Street.
Homer, John Albert.....	Utah	944 New York Ave.
Horner, Errol Osman.....	N. J.	Y. M. C. A.
Hunt, Shella Leigh.....	Wash.	The Plymouth.

Name.	Legal residence.	City address.
Hunter, Clyde Elliott.....	D. C.	Y. M. C. A.
Hutchins, Wells Aleck.....	D. C.	The Portner.
Jenkins, Warren Maxwell.....	Pa.	2506 Pennsylvania Ave.
A.B., 1906, Grove City College.		
Jobson, Alexander Blaikie.....	Pa.	Y. M. C. A.
A.B., 1901, Washington and Jefferson College.		
Johnson, Elbert Culbreth.....	Wash.	942 K Street.
Johnston, Cecil Wallace.....	Pa.	540 Y. M. C. A.
Kartack, Roy Ernest.....	Wisc.	1306 13th Street.
Kelly, Jerry E.....	S. D.	Senate Annex.
Kester, Bruce Randall.....	Pa.	1008 K Street.
Lawburgh, Robert Lee.....	Ind.	923 L Street.
A.M., 1905, De Pauw University.		
Lee, William Burch.....	La.	Riggs House.
McDermott, Charles William.....	Mass.	221 1st Street, N. E.
Macfarland, Henry B. F.....	D. C.	1727 F Street.
Meyer, Herbert Alton.....	Ohio	118 R Street, N. E.
Micou, Richard Dunnica.....	Va.	33 Home Life Bldg.
B.A., 1903, M.A., 1903, University of Virginia.		
Moll, Aristides	P. R.	537 21st Street.
A.B., University of Barcelona, Spain.		
Morrow, James Benjamin.....	D. C.	3123 13th Street.
Pearce, Harry Mamlin.....	Mich.	540, Y. M. C. A.
A.B., 1905, Albion College.		
Perry, Alexander Wallace.....	D. C.	2003 I Street.
Graduate, U. S. Military Academy.		
Prouty, Ward	Vt.	The Portner.
Pyle, Lawrence Augustus.....	D. C.	Fendall Building.
Reinohl, David Weimer.....	D. C.	Manor House.
Reyburn, William Stuart.....	D. C.	1785 Massachusetts Ave
Ph.B., 1904, Yale University.		
Rice, Frederick Joseph.....	D. C.	118 C Street, S. E.
Rowley, George I., Jr.....	Mass.	Y. M. C. A.
Shallenberger, Don	Ohio	1226 12th Street.
Smithers, Nathaniel Barratt.....	Del.	2002 G Street.
Smoot, John Daniel Kurtz.....	Va.	Langley, Va.
Stonebraker, Harold English.....	Pa.	645 Massachusetts Ave., N. E.
Stuart, Paul Allison.....	Pa.	2506 Pennsylvania Ave.
A.M., 1906, Washington and Jefferson College.		
Sullivan, Horace Moore.....	Tenn.	229 North Capitol Street.
Swenarton, Harold Augustus.....	N. J.	1336 I Street.
Ph.B., 1905, Yale University.		

Name.	Legal residence.	City address.
Tucker, John Randolph.....	Va.	602 Cameron Street, Alexandria, Va.
Tyrer, Arthur James.....	Wash.	The Albemarle.
Wagner, Harold J.....	N. Y.	Dept. of Justice.
Warrington, Isaac Davisson.....	D. C.	1331 Vermont Ave.
Whiting, Roscoe Everett.....	Wash.	The Stratford.
A.B., 1901, Bowdoin College.		
Whitney, William Milton.....	Ohio	3068 Wisconsin Ave.
A.B., 1903, Ohio Wesleyan University.		
Wilson, Huntington	Ill.	1155 16th Street.
B.A., 1897, Yale University.		
York, Arthur Blaine.....	W. Va.	The Coywood.

Second Year.

Adams, George Royal.....	Mass.	Y. M. C. A.
Allen, Charles Louis.....	S. D.	1516 K Street.
Ambrose, George Lewis.....	Mont.	725 20th Street.
Arundell, Charles Rogers.....	D. C.	1636 R Street.
Atwell, Howard Johnson.....	Va.	711 A Street, N. E.
Banning, Archibald Tanner, Jr....	N. Y.	1445 Massachusetts Ave.
A.B., 1904, Cornell University.		
Barndollar, Burton Hack.....	Penn.	3510 New Hampshire Av.
Beall, John Christopher Wagner..	D. C.	1016 East Capitol St.
Bell, Colley Wood.....	D. C.	The Melrose.
Berger, Bertram Philip.....	N. Y.	Civil Service Com.
Betts, Frank Marshall.....	Ark.	315 H Street.
Binsted, John Henry.....	D. C.	Conduit Road.
Biscoe, John Edward.....	D. C.	813 21st Street.
Grad. Engr., 1904, Virginia Military Technical Institute.		
Block, Karl Morgan.....	D. C.	155 11th Street, N. E.
B.A., 1906, The George Washington University.		
Boesch, Harry Luther.....	D. C.	616 E Street, N. E.
Bowen, Frank Hunter.....	Mass.	Dept. Com. & Labor.
Brandenburg, Edgar Thomas.....	Pa.	915 French Street.
Brunings, John Hermann.....	Ill.	Patent Office.
Calder, Albert Russell.....	Pa.	917 North Carolina Ave.
Campbell, Paul	Tenn.	229 North Capitol Street.
Carr, Ira J.....	Mich.	Treasury Department.
Carrington, Edmund	D. C.	Mt. Vernon Apartments.
Christensen, Andrew	Utah	Room 232, P. O. Dept.
Church, Melville Durant.....	D. C.	1608 20th Street.
Cooke, H. Clay.....	Texas	Y. M. C. A.

STUDENTS IN THE UNIVERSITY.

225

Name.	Legal residence.	City address.
Couden, Fayette Dickinson.....	Mass.	1310 Columbia Road.
B. Sc., 1904, Massachusetts Agricultural College.		
Cutler, Harold Bert.....	Iowa	1516 K Street.
Dane, Walter Alden.....	Vt.	1445 Massachusetts Ave.
B.A., 1903, University of Vermont.		
Davenport, Lewis Howard.....	N. Y.	2624 University Place.
Davidson, Arthur William.....	Ohio	9 Grant Place.
A.B., 1899, Western Reserve University.		
Davis, Horace Webber.....	Pa.	2506 Pennsylvania Ave.
B.S., 1905, Washington and Jefferson College.		
Ellis, Leonidas Wilson.....	Ala.	1304 L Street.
Fravel, F. Russell.....	Mass.	619 22d Street.
Guy, Walter Bohrer.....	D. C.	308 5th Street, S. E.
Ph.B., 1905, Lafayette College.		
Haines, Milton	Ohio	905 13th Street.
B.S., O. N. U.		
Hardy, Edward Hugh.....	Ala.	1014 Massachusetts Ave.
Hartson, Clinton Henry.....	Wash.	2021 H Street.
Henault, Thomas Ransel.....	D. C.	2016 G Street.
Hendry, Moses Walton.....	Md.	Bethesda, Md.
A.B., 1903, Johns Hopkins University.		
Henry, Samuel Joseph.....	D. C.	Brookland, D. C.
Hepburn, Louis Frederick.....	Pa.	1517 H Street.
Hichborn, Philip Simmons.....	D. C.	1707 N Street.
Hindman, Albert Clare.....	Pa.	1208 N Street.
Hinshaw, Howard Raymond.....	Nebr.	The Dewey.
Holmes, Rexford Louis.....	Mo.	1114 D Street, N. E.
Hughey, Allen Harrison.....	Texas	Geological Survey.
B.A., 1903, Vanderbilt University.		
Ilustre, Eustacio S.....	P. I.	Room 33, War Dept.
Jensen, John	Utah	915 L Street.
B.A., 1906, University of Utah.		
Jones, Charles Andrews.....	D. C.	1319 F Street.
Jones, George Bayard.....	Mo.	33 B Street.
B.S., 1905, Massachusetts Institute of Technology.		
Jones, Robert McGuire.....	Va.	1736 G Street.
B.S., 1902, William and Mary College.		
Kellett, Joe Cabot.....	Ala.	935 K Street.
B.S., 1905, Oklahoma Agricultural and Mechanical College.		
Levin, Michael	Wisc.	1306 13th Street.
McClellan, George Browning.....	Hawaii	The Cumberland.
McLean, Hubert Gilbert.....	Mich.	1319 Irving Street.

Name.	Legal residence.	City address.
McNeal, Ira Bennett.....	Pa.	1301 K Street.
A.B., 1898, Dickinson College.		
McNeill, Frank Augustus.....	Va.	1430 W Street.
Mancha, Henry Howard.....	Mich.	1301 K Street.
Maphis, Frederick De Witt.....	Va.	1114 10th Street.
Mason, L. Randolph.....	Md.	1114 14th Street.
Miller, William Lewis.....	D. C.	500 5th Street.
Mitchell, Paul.....	Pa.	1804 M Street.
A.B., 1905, Allegheny College.		
Mitchell, William Hadwen.....	Mass.	University Club.
B.S. in Elec., 1905, Worcester Polytechnic Institute.		
Mueller, Curt Berthold.....	Ohio	G. W. U.
A.B., 1906, Cornell University.		
Murphy, William Ashford.....	Wash.	1103 10th Street.
Neal, Chester-Trenholm.....	Mass.	1445 Massachusetts Ave.
B.A., 1905, Yale University.		
Owen, Claud Worthington.....	Md.	913 F Street.
Owens, Charles Francis.....	Md.	466 Louisiana Ave.
Patterson, James Frosst.....	D. C.	Room 618, Mills Bldg.
Patterson, Matthew Waren.....	Ark.	1391 F Street, N. E.
Phillips, Adon Daniel.....	N. Y.	715 Lawrence St.
B.S., 1906, The George Washington University.		
Phillips, Ivon William.....	N. Y.	3618 11th Street.
Pretzfelder, Leon.....	Va.	Room 407, P. O. Dept.
Ramsey, George William.....	Ill.	Patent Office.
Rathbun, Don Seavey.....	Iowa	War Department.
B.S., 1904, Cornell University.		
Rehr, Paul Allen.....	Pa.	1736 G Street.
Riddleberger, Harrison Heath....	Va.	U. S. Senate
Roberts, George F.....	Mo.	1443 East Capitol Street.
Roche, Sidney.....	D. C.	1325 1st Street, S. W.
Rodier, Henry Tait.....	D. C.	1334 Wallach Place.
Rowe, James Hubert Joseph.....	N. J.	The Oxford.
Russell, Arthur Jasper.....	Pa.	930 16th Street.
Rutherford, Reginald.....	Md.	922 French Street.
Scantling, Philip Lee.....	D. C.	1213 New Jersey Ave.
Sheridan, James MacDermott.....	Colo.	1736 G Street.
Smith, Dyer.....	Pa.	The Woodley.
M.E., 1903, Lehigh University.		
Smith, Ellison Griffith.....	S. D.	1516 K Street.
Smith, George Thomas.....	Md.	Room 234, P. O. Dept.
Stein, Simon Bernard.....	Mass.	904 Westminster Street.
Stevenson, Charles.....	N. Y.	836 Varnum Street.

STUDENTS IN THE UNIVERSITY.

227

Name.	Legal residence.	City address.
Stull, Howard William.....	Pa.	Takoma Park.
Sunderlin, Louis Kossuth.....	Iowa	The New Berne.
Swayze, Samuel	N. J.	1614 Rhode Island Ave.
Taylor, Louis Ralph.....	Ill.	The Iroquois.
Tracey, Frederick H.....	Ohio	1842 Monroe Street.
Turner, Robert Hite.....	Va.	507 H Street.
Twyeffort, Frank Hubbard.....	N. Y.	1736 G Street.
Ulke, Titus	D. C.	411 15th Street.
B.S., 1885, Columbian University.		
E.M., 1889, Royal Academy of Mines, Freiberg, Saxony.		
Weddell, Alexander Wilbourne...	Va.	1901 I Street
Weed, Theodore Linus.....	D. C.	1232 Massachusetts Ave.
West, William	Ky.	1718 Corcoran St.
Whalley, William John.....	D. C.	1218 Georgia Ave., S. E.
Whitten, William Henry, Jr.....	Ill.	1123 Fairmont Street.
B.S., 1896, M.S., 1897, Massachusetts Institute of Technology.		
Wiggins, Ernest	S. C.	1322 Rhode Island Ave.
A.B., 1899, Wofford College.		
Willis, Robert Chadwick.....	N. C.	706 Munsey Building.
A.B., Guilford College.		
Wilson, Ira Jay.....	Wisc.	Room 112, Patent Office.
Yocum, Wilbur Elmore.....	Fla.	1807 Phelps Place.
B.A., 1898, Florida Agricultural College.		

Third Year.

Acton, Robert Dow.....	Ill.	711 Bond Building.
Agnew, Albert Conant.....	Ind. Ter.	1213 N Street.
Alden, Henry Palmer.....	D. C.	1308 S Street.
Amadeo y Gely, Antonio José.....	P. R.	1406 15th Street.
LL.B., 1906, Grant University.		
Amiss, T. Brooke, Jr.....	N. Y.	9. The Henrietta.
Andrews, Edward Hopkins.....	Mich.	1337 Columbia Road.
A.B., 1902, Olivet College.		
Baker, Arthur George.....	Mass.	P. O. Dept
B.A., 1903, Amherst College.		
Ballard, William Reed.....	Ind.	2626 University Place.
Barth, John Frederick.....	Ky.	Post Office Department.
Barker, William Judson.....	D. C.	142 13th Street, S. E.
Bowlby, John Hudson.....	Nebr.	1720 H Street.
A.B., 1903, Doane College.		
M.A., 1906, University of Nebraska.		
Bowyer, Joseph McCarter.....	Pa.	The Westmoreland.
B.S., 1904, Princeton University.		

Name.	Legal residence.	City address.
Braddock, Ernest Reeves.....	Md.	1906 3d Street.
Brearton, James Mitchell.....	Ill.	2021 H Street.
Buffington, William E.....	Pa.	1501 11th Street.
Burriss, John Murray.....	Kansas	1615 Florida Ave.
Carnes, Samuel Clifford.....	Ohio	2021 H Street.
Christian, Charles Frederick.....	Ind.	1203 N Street.
Cowgill, Guy Milton.....	Iowa	1720 H Street.
A.B., 1902, University of Nebraska.		
Crain, Kenneth	Ky.	1820 G Street.
B.A., 1902, University of Louisville.		
Deller, Luster K.....	Ind.	21 P Street.
Duffey, Louis Nelson.....	Va.	Alexandria, Va.
Dunning, Daniel Alfred.....	Utah	1419 Chapin Street.
Fitz Gerald, Shepler Ward.....	D. C.	3515 11th Street.
Gammon, Nathan	Tenn.	1931 K Street.
Garner, Henceford Noel.....	Va.	Alexandria, Va.
Geissler, Mahlon Hobart.....	Conn.	927 L Street.
Gerry, Charles Fusting.....	Md.	1217 N Street.
Gilchrist, Walter Schell.....	D. C.	717 East Capitol Street.
A.B., 1902, Georgetown College.		
Giles, Louis Edward.....	Mich.	1608 15th Street.
B.S., in E.E., Columbian University.		
Glennan, Arthur Wyman.....	D. C.	Chevy Chase, Md.
Groomes, Leonard Weer.....	Md.	1405 New York Ave.
Gusack, Samuel Victor.....	D. C.	921 Westminister Street.
Guyton, Joseph Daniel.....	Miss.	1921 G Street.
B.S., 1901, Mississippi Agricultural and Mechanical College.		
Hallam, Paul Rankin.....	Ky.	504 Seward Square, S. E.
Hand, Robert G.....	Miss.	1216 Girard Street.
B.S., 1899, Mississippi Agricultural and Mechanical College.		
Harding, Lee Robert.....	Iowa	Chevy Chase, Md.
Hattersley, Ralph Marshall.....	Ohio	1931 13th Street.
Henkel, Myron Freeman.....	Ill.	1931 K Street.
Hogg, William Leonard.....	Colo.	1517 P Street
A.B., 1904, Colorado College.		
Hoover, Dickerson Naylor, Jr.	D. C.	413 Seward Square, S. E.
Huffman, Charles Jones.....	Ill.	1343 Girard Street.
Irion, Harry	Colo.	414 A Street, S. E.
Keeler, Earle Leslie.....	Mass.	918 H Street.
Kennedy, John Thomas.....	Pa.	Y. M. C. A.
Langmade, Robert Grover.....	N. Y.	1203 N Street.
Law, Frank A., Jr.....	D. C.	1627 14th Street.

Name.	Legal residence.	City address.
Leech, Wilmer Ross.....	Md.	2302 1st Street.
Lees, Fred	Kansas	Forest Service.
A.B., 1900, Washburn College.		
Leet, Alfred Boyan.....	D. C.	1739 19th Street.
Lewis, Henry Latané.....	Md.	1413 G Street.
Lewis, William J.....	N. H.	1113 M Street.
Lundy, Elmer Johnston.....	Ark.	1613 13th Street.
B.S., 1890, Dickson College.		
Manning, Lawrence Warren.....	Ky.	1611 Riggs Place
Mead, Thomas L.....	Ohio	3022 R Street.
Ph.B., 1901, Western Reserve University.		
Melby, Charles Beach.....	Wisc.	1517 P Street.
Merrill, Henry Pettingale.....	D. C.	1760 Willard Street
Moore, Robert Irwin.....	Tenn.	1408 M Street.
B.A., 1898, Vanderbilt University.		
Morris, Charles Meyer.....	Utah	15 6th Street, N. E.
Morris, Jackson	Ky.	1723 Willard Street.
Needham, Hubbard Smith.....	Kv.	2024 G Street.
Neighbors, Henry Fletcher.....	N. Y.	1760 Church Street.
Packard, Edwin Augustus.....	Mass.	226 2d Street, N. E.
B.S., 1899, Massachusetts Institute of Technology.		
Paddock, William Waterman.....	Iowa	1521 Vermont Ave.
Peake, William Thomas.....	D. C.	121 10th Street, N. E.
Phair, Philip De Witt.....	Maine	131 A Street, N. E.
M.A., 1906, Harvard University.		
Prettyman, William Forrest.....	Md.	G. W. U.
M.A., 1904, Randolph Macon College.		
Roberts, Ora Herbert.....	Texas	1443 East Capitol Street.
Ross, Montague Sutton.....	Tenn.	1031 K Street.
A.B., 1903, University of Nashville.		
Schommer, John B.....	Wisc.	Union Building.
Smith, John Abdiel.....	Pa.	1114 New York Ave.
Smith, James Cheetham.....	Pa.	
Stadden, Corry Montague.....	Ohio	3002 13th Street.
Staples, Euguen Washington.....	Maine	814 11th Street, N. E.
Steele, Benjamin Ulen.....	Ky.	111 12th Street, S. E.
Steenerson, Benjamin Gilbert.....	Minn.	1804 G Street.
Stewart, Edward Smith.....	Md.	1121 8th Street.
Swank, Walter Ray.....	Colo.	Y. M. C. A.
Taylor, Rowland Corwin.....	Ohio	2018 G Street.
Thomas, Enfield Hoge.....	Va.	Room 306, P. O. Dept.
Thompson, William Enos.....	Ill.	Treasury Department.

Name.	Legal residence.	City address.
Tuckerman, Walter R.....	D. C.	1515 Massachusetts Ave. .
B.A., 1903, Harvard University.		
Tyler, Frank E.....	Miss.	Geological Survey Bldg.
Veley, Omar Jay.....	N. Y.	1369 Emerson St., N. E.
Voorhis, Charles D.....	N. J.	
Wallace, Reuben Staten.....	Md.	206 Elm Street.
Washington, Richard Blackburn.....	Va.	Library of Congress.
Weeks, Edward Mitchell.....	Pa.	Cleveland Park.
Weir, Taylor Bladen.....	Va.	Dept. of Agriculture.
Whippler, Frederic R.....	D. C.	The Cairo.
Williams, Henry Trumbull.....	Mass.	1446 Massachusetts Ave.
S.B., 1903, Harvard University.		
Williamson, James McGowan....	D. C.	1210 S Street.
Wilmot, Wilson Eardley.....	N. Y.	2224 F Street.
Winbourn, Robert Emmet.....	Colo.	1517 P Street.
Woodward, Franklin Tuthill....	D. C.	915 S Street.
A.B., 1901, Dickinson College.		
Woolsey, Lester Hood.....	N. Y.	1404 Park Road.
A.B., 1901, Harvard University.		
Woolverton, William Hand.....	Miss.	1216 Girard Street.
B.A., 1903, Dartmouth College.		

Special.

Ballard, William Reed.....	Ind.	Room 105, Patent Office.
Boyden, John Hanson.....	Va.	1014 K Street.
B.S. in E.E., 1906, The George Washington University.		
Cartwright, Otis Thomas.....	D. C.	3014 Dent Place.
Denby, Charles.....	D. C.	1308 Connecticut Ave.
A.B., 1882, Princeton University.		
Finney, Harry Whiting.....	D. C.	2204 Q Street.
Gerdson, William Cornelius.....	Minn.	907 M Street.
M.S., 1905, The George Washington University.		
Hall, Mark Anthony.....	D. C.	706, The Sherman.
Hastings, Grover Cleveland.....	D. C.	2812 13th Street.
Hopkins, Fred Merriam.....	Mich.	U. S. Patent Office.
Hughes, Patrick Whistead.....	W. Va.	1011 H Street.
Jones, William Phelps.....	N. Y.	920 C Street, N. E.
E.E., 1898, Columbia University.		
Philips, Henry Hyman.....	N. C.	1122 Vermont Ave.
B.S., 1905, LL.B., 1906, University of North Carolina.		
Pillow, Gideon Johnston.....	La.	1464 Clifton Street.

Name.	Legal residence.	City address.
Sherier, Joseph Tyler.....	D. C.	611 Jenifle Building.
LL.B., 1904, Columbian University.		
Smith, Delos Hamilton.....	Ariz.	1905 F Street.
B.S. in Architecture, 1906, The George Washington University.		
Terry, David Dickson.....	Ark.	U. S. Senate.
Thomas, Bert Carl.....	Ohio	1124 10th Street.

Review.

Anderson, Edward Dunning.....	D. C.	2813 14th Street.
LL.B., 1903, Columbian University.		
Bielaski, Alexander Bruce.....	Md.	Department of Justice.
LL.B., 1904, The George Washington University.		
Ellison, William Bascom.....	Tenn.	3013½ Sherman Ave.
LL.B., 1903, The George Washington University.		
English, Walter Charles.....	D. C.	2907 P Street.
LL.M., 1905, The George Washington University.		
Fuller, Charles Franklin.....	N. Y.	1320 U Street.
B.S., 1901, LL.B., 1906, The George Washington University.		
Goodall, Milo B.....	Wisc.	427 15th Street, S. E.
LL.B., 1906, The George Washington University.		
Hathaway, Alvin Dolph.....	Ky.	1326 New York Ave.
LL.B., 1903, The George Washington University.		
Hazard, Elmont Bibb.....	D. C.	320 E. Street, N. E.
LL.B., 1906, The George Washington University.		
James, Charles Grant.....	Ohio	Bureau of Pensions.
LL.B., 1905, The George Washington University.		
Lockwood, Carl	D. C.	23 7th Street, S. E.
LL.B., 1903, The George Washington University.		
Morgan, Eugene	D. C.	1332 I Street.
LL.B., 1881, LL.M., 1891, Columbian University.		
Oberlin, Paca	Va.	1238 5th Street.
LL.B., 1903, LL.M., 1904, Colorado University.		
Reinohl, William Parker.....	D. C.	912 F Street.
LL.B., 1901, Columbian University.		
Rhodes, Fred Burnett.....	Md.	1488 Newton Street.
LL.B., 1905, The George Washington University.		
Spinks, Edgar	Miss.	General Land Office.
LL.B., 1905, The George Washington University.		
Taggart, Giles Russell.....	N. J.	608 Harvard Street.
B.S., 1900, LL.B., 1906, The George Washington University.		

Name.	Legal residence.	City address.
Wilmoth, Warner Lambeth.....	Texas	1706 9th Street.
LL.B., 1906, The George Washington University.		
Woods, Walter Orr.....	Kansas	292 War Department.
LL.B., 1906, The George Washington University.		

Master of Laws.

Brooke, John Cooke.....	Va.	820 6th Street.
B.S., 1901, Virginia Polytechnic Institute.		
LL.B., 1905, Georgetown University.		
Brothers, Charles Shields.....	Miss.	1931 K Street.
LL.B., 1902, University of Mississippi.		
Clark, Daniel Nelson.....	D. C.	Wash. Loan and Trust Building.
LL.B., 1901, Highland Park College of Law.		
Cronin, Patrick D.....	Mass.	1519 Vermont Ave.
LL.B., 1902, Columbian University.		
Flowers, Allen Gilbert.....	S. C.	2909 13th Street.
LL.B., 1906, The George Washington University.		
Garnett, Philip Manly.....	N. H.	1347 U Street.
LL.B., 1906, The George Washington University.		
Harralson, Morris	Ga.	1016 15th Street.
LL.B., 1906, The George Washington University.		
Morris, Jackson	Ky.	1723 Willard Street.
Phillips, Francis John.....	N. Y.	Bureau of Immigration and Naturalization.
LL.B., 1906, The George Washington University.		
Sanders, Franklin Oliver.....	Pa.	2909 13th Street.
LL.B., 1906, The George Washington University.		
Simpson, James T.....	N. H.	Treasury Department.
LL.B., 1906, The George Washington University.		
Sommers, Walter Allwood.....	N. Y.	657 F Street, N. E.
LL.B., 1905, St. Lawrence University.		
LL.B., 1906, The George Washington University.		
Stelle, William Harrison.....	Ill.	230 North Capitol Street.
LL.B., 1906, University of Illinois.		
Stetson, Frank	D. C.	Nat'l Safe Deposit Savings and Trust Co.
LL.B., 1906, The George Washington University.		
Swingle, Edwin Allan.....	D. C.	807 T Street.
LL.B., 1906, The George Washington University.		
Weitzel, Fred William.....	Ky.	1210 Harvard Street.
LL.B., 1906, The George Washington University.		

Review.

English, Walter Charles.....	D. C.	2907 P Street.
LL.B., 1903, LL.M., 1905, The George Washington University.		

Name.	Legal residence.	City address.
Fenton, Theodore Cornell.....	Pa.	1763 Church Street.
LL.B., 1892, LL.M., 1893, M. E., 1900, Columbian University.		
Gow, Bernard Arthur.....	Mo.	921 8th Street.
LL.B., 1896, Missouri State University.		
LL.M., 1904, Columbian University.		
Logan, Charles Bryce.....	Mo.	900 M Street.
LL.B., 1903, Kansas City School of Law.		
LL.M., 1905, The George Washington University.		
Morgan, Eugene	D. C.	1322 I Street.
LL.B., 1881, LL.M., 1891, The George Washington University.		
Oberlin, Paca	Va.	1238 5th Street.
LL.B., 1903, LL.M., 1904, Colorado University.		
M.Dip., 1905, The George Washington University.		

Master of Patent Law.

Anderson, John Henry.....	Ohio	2024 G Street.
LL.B., 1906, National University.		
Benfer, James Pomeroy.....	Ohio	Geological Survey.
LL.B., 1898, Georgetown University.		
LL.M., 1900, Columbian University.		
Bon Durant, William Wilson.....	Ill.	Mount Rainier, Md.
LL.B., 1906, Washington College of Law.		
Bryant, Emory Addison.....	D. C.	3440 Brown Street.
LL.B., 1906, National University.		
D.D.S., 1886, Baltimore College of Dental Surgery.		
Calver, Arthur Walter.....	D. C.	1721 P Street.
LL.B., 1905, National University.		
Coffin, Charles Buxton.....	D. C.	1116 15th Street.
LL.B., 1906, The George Washington University.		
Colford, Ethel Marguerite....	Nova Scotia.	2310 20th Street.
LL.B., 1903, LL.M., 1904, Washington College of Law.		
Colford, Florence Agnes.....	Nova Scotia.	2310 20th Street.
LL.B., 1903, LL.M., 1904, Washington College of Law.		
Duras, Charles Otto.....	Nebr.	Y. M. C. A.
LL.B., 1906, National Law School.		
Fenton, Theodore Cornell.....	D. C.	1763 Church Street.
LL.B., 1892, LL.M., 1893, M.E., 1900, Columbian University.		
Griesbauer, John Andrew, Jr.....	D. C.	1221 Irving Street.
LL.B., 1905, The George Washington University.		
Hodges, Lewis	D. C.	1607 Irving Street.
LL.B., 1906, The George Washington University.		

THE GEORGE WASHINGTON UNIVERSITY.

Name.	Legal residence.	City address.
Hyde, Elbert Lewis.....	Ohio	1814 North Capitol St.
B.S., 1903, Case School of Applied Science.		
Keller, Arthur Ripont.....	N. Y.	1306 Corcoran Street.
C.E., 1903, Cornell University.		
LL.B., 1906, National University Law School.		
Lyons, Charles S.....	Ky.	Isthmian Canal Commis- sion.
Mason, Eugene George.....	D. C.	Wash. Loan and Trust Building.
LL.B., 1906, National Law School.		
Pack, Samuel Bernard.....	Pa.	2443 Ontario Road.
LL.B., 1906, National Law School.		
Russell, Bert	Md.	318 Patent Office.
A.M., 1903, University of Minnesota.		
LL.B., 1906, Georgetown University.		
Siebold, William Otto.....	N. Y.	1549½ 3d Street.
LL.B., 1906, National University.		
B.S., 1895, Cornell University.		
Sizer, Adrian	Pa.	Colorado Building.
LL.B., 1901, LL.M., 1902, Georgetown University.		
Swift, Dean	Va.	505 7th Street.
LL.M., 1901, National University.		
Toohy, Frank	Mass.	Room 167, Patent Office.
Van Nest, Raymond Henry.....	D. C.	Room 242, Patent Office.
LL.B., 1906, Georgetown University.		

Review.

Anderson, Edward Dunning.....	D. C.	2813 14th Street.
LL.B., 1903, Columbian University.		

Auditor.

Clift, James Walter.....	D. C.	1434 Chapin Street.
LL.B., 1902, National Law School.		

Summary.

CANDIDATES FOR THE LL.B. DEGREE:

First year	70
Second year	107
Third year	97
Special	283
Review	17
CANDIDATES FOR THE LL.M. DEGREE.....	18 35
Review	16
CANDIDATES FOR THE M.P.L. DEGREE.....	6 22
Review	23
Auditor	1 25
	365

DEPARTMENT OF POLITICS AND DIPLOMACY.

Doctor of Civil Law.

Name.	Legal residence.	City address.
Miller, Clarence Alphonso.....	Mo.	Bureau of Corporations. LL.B., 1899, Kansas City School of Law. LL.M., M.Dip., 1906, The George Washington University.

Master of Diplomacy.

Dorsey, Roscoe J. C.....	Pa.	1217 I Street. LL.B., 1902, LL.M., 1903, Georgetown University.
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Special.

Aldridge, W. T.....	D. C.	833 Allison Street.
Baden, James H.....	D. C.	5 S Street, N. E.
Bagby, R. H.....	Va.	703 8th Street, S. E.
Bedford, A. H.....	Md.	15th and L Streets.
Bowman, John A.....	D. C.	61 I Street.
Childs, W. H.....	Md.	3014 Dent Place.
Cissel, Robert Ashton.....	D. C.	2117 Pennsylvania Ave.
Claxton, A. B.....	D. C.	1682 Irving Street.
Devereux, Frank B.....	D. C.	The Nansemond.
Eckloff, Charles C.....	D. C.	429 I Street.
Evans, J., Jr.....	Md.	1925 G Street.
Faber, J. D.....	Md.	Takoma Park, D. C.
Fawcett, E. S.....	Va.	Alexandria, Va.
Fisher, Arthur Ames.....	D. C.	1833 V Street.
Frost, Paul Delevan.....	Iowa	926 Westminster Street.
Gilmore, Frank B.....	Pa.	411 4½ Street.
Hanna, Charles W.....	D. C.	1827 North Capitol St.
Haynes, H. V.....	Pa.	1349 Kenyon Street.
Heimbeck, Adolph James.....	Iowa	297 Treasury Dept. M.Dip., 1905, The George Washington University.
Herrell, Ernest G.....	Va.	515 Seward Square, S. E.
House, H. S.....	Mo.	1526 O Street.
Jacobsen, C. F.....	D. C.	1008 N Street.
Magruder, Willis B., Jr.....	D. C.	2032 North Capitol St.
Marshall, Thomas, Jr.....	Va.	1737 Willard Street.
Moore, George W.....	Md.	45 Quincy Street.
Moore, Thomas E.....	Md.	45 Quincy Street.
Payne, E. E.....	Va.	Alexandria, Va.
Petty, John A.....	D. C.	1409 Chapin Street.

Name.	Legal residence.	City address.
Phelps, Horace J.....	Mo.	The Iowa.
Pierce, Carrall	Va.	Alexandria, Va.
Poole, John	W. Va.	1838 4th Street
Poole, William T.....	D. C.	1911 4th Street.
Ricoy, Luis	Mexico	1415 I Street.
Riordon, John M.....	Va.	401 6th Street, S. E.
Ritchie, Wayne	D. C.	2560 Wisconsin Ave.
Settle, J. C.....	Ga.	1310 Wallach Place.
Tillman, Lloyd M.....	Tenn.	1328 Euclid Street.
Whitaker, Wallace A.....	D. C.	1741 Park Road.
Wilson, E. P.....	D. C.	2145 California Ave.
Wolfe, Edmund S.....	D. C.	21 T Street.

Review.

Heimbeck, Adolph James.....IowaTreasury Department.
M.Dip., 1905, The George Washington University.

Summary.

Candidate for the D. C. L. Degree.....	1
Candidate for the M. Dip. Degree.....	1
Special	40
Review	1

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NATIONAL COLLEGE OF PHARMACY.

Doctor of Pharmacy.

Freshmen.

Name.	Legal residence.	City address.
Bailey, Ray T.....	D. C.	116 C Street, N. E.
Bell, Miles William.....	Pa.	1235 W Street, N. W.
Boone, Benj. B.....	Ala.	1656 Munroe St., N. W.
Crosen, George Robert.....	Va.	1222 C Street, S. W.
Davis, Jno. F., Jr.....	D. C.	601 9th Street, N. E.
Gaines, George Raymond.....	Va.	Alexandria, Va.
Gill, Theodric Leith.....	Va.	9th and P Streets, N. W.
Harbaugh, Lewis M.....	D. C.	1375 Emerson St., N. E.
Harris, Eugene	D. C.	608 Albany Street, N. E.
Hines, Arnold S.....	Utah	1246 11th Street, N. W.
Hanback, Clifford	D. C.	44 N. Y. Ave., N. E.

Name.	Legal residence.	City address.
Jones, Thos. Quinn.....	Mo.	1202 N Street, N. W.
Jones, Wm. Sidney.....	Va.	317 Prince Street, Alexandria, Va.
Jenkins, Lawrence J.....	Va.	510 Maine Ave., S. W.
Linton, Howard	Md.	311 S Street, N. W.
Lynham, Calvin L.....	D. C.	1213 4½ Street, S. W.
Milburn, Frank N.....	Va.	Alexandria, Va.
MacWilliams, Norbert	Md.	354 I Street, S. W.
Nyce, Benj. B.....	D. C.	2d and Pa. Ave., S. E.
Payne, Edward F.....	Va.	123 C Street, N. E.
Payne, Daniel Beeckner.....	Va.	616 G Street, S. W.
Perkins, Wallis C.....	Md.	942 P Street, N. W.
Reese, Chauncey Clifford.....	Md.	18 Quincey Place.
Richardson, Irene Nellie.....	D. C.	1308 U Street, N. W.
Robey, Frank A.....	Va.	Herndon, Va.
Sanford, Joseph William.....	D. C.	N. Capitol Street and New York Ave., N. W.
Senay, Harry J.....	D. C.	439 K Street, N. W.
Simmons, John William.....	D. C.	35 and O Streets, N. W.
Schroeder Robert M.....	D. C.	524 9th Street, S. E.
Simpson, Harry N.....	D. C.	461 I Street, S. W.
Tewksbury Melville B.....	Kansas	16 3d Street, S. E.
Vaughn, Draper	Md.	Oakland, Md.
Widmayer, William	D. C.	3129 Brightwood Ave., N. W.
Yeatman D. Ammen.....	D. C.	1729 F Street, N. W.

Juniors.

Boyer, W. Robey.....	Md.	14th and P Streets.
Deming, Carroll G.....	D. C.	937 K Street.
Eppard, George I.....	Va.	1021 G Street.
Everett, James T.....	D. C.	133 12th Street, N. E.
Floyd, Henry B.....	Ark	1016 Massachusetts Ave.
Hughes, Henry D.....	D. C.	28th and N Streets
Leatherland, Lawrence C.....	Va.	King and Alfred Streets, Alexandria, Va.
Nolan, James I.....	Ill.	1164 5th Street, N. E.
Pozen, Morris A.....	D. C.	1410 I Street.
Saeb, George R.....	D. C.	617 9th Street, N. E.
Spencer, Robert Bruce.....	N. C.	Falls Church, Va.
Steele, Ernest H.....	Va.	Kensington, Md.
Timberlake, T. O.....	Va.	1101 13th Street.
Thibadeau, Richard B.....	Ga.	Virginia Plats.
Thompson, Milton C.....	D. C.	130 8th Street, S. E.
Thorn, William D.....	D. C.	1412 35th Street.

Seniors.

Name.	Legal residence.	City address.
Colby, Herman H.....	Germany	U. S. Naval Hospital, 9th and Pa. Av., S. W.
Cantwell, William J.....	D. C.	455 Massachusetts Ave., N. W.
Day, Alvin N.....	N. J.	E. Capitol and 11th Sts., N. E.
Jacobs, Jno. R.....	N. Y.	119 H Street, N. W.
Keister, John T.....	Va.	Bureau of Chem. Agric. Department.
Laubinger, Louis	Germany	228½ Q Street, N. W.
Lantz, H. H.....	Va.	14th & U Streets, N. W.
Madigan, Robert Emmett.....	D. C.	432 Monroe Street, Ana- costia, D. C.
Myers, Robert I.....	D. C.	120 Florida Ave., N. W.
Nelson, Stella	Okla.	1st and C Streets, N. W.
O'Neill, A. J.....	D. C.	710 10th Street, N. E.
Preuss, Benno. R.....	Texas	227 P Street, N. W.
Pitzer, Frederick Hazen.....	D. C.	5th & E. Capitol Streets.
Richardson, Mary H.....	Ohio	3d and Pa. Ave., N. W.
Sacks, Louis	Germany	3233 M Street, N. W.
Spire, W. Burton.....	N. Y.	1120 C Street, S. W.
Schulze, Gustave H., Jr.....	D. C.	1751 L Street, N. W.
Troxler, Robert F.....	Ky.	229 N. J. Ave., S. E.

Students Taking Special Courses.

Cooney, J. P.....	D. C.	Mills Building.
Houghton, A. M.....	D. C.	3064 Q Street, N. W.
Sullivan, Arthur H.....	D. C.	1461 Chapin St., N. W.

Summary.

CANDIDATES FOR THE PHAR.D. DEGREE:

Freshmen	34
Juniors	16
Seniors	18
	<hr/> 68
Special	3
	<hr/>
Total	71

GEOGRAPHICAL DISTRIBUTION OF STUDENTS.

United States.	G. S.	C. C.	W. C. E.	Arch.	Teach.	Med.	Dent.	Law.	P. & D.	Phar.	Total.
Alabama		3				1		3	1		8
Arizona		1						1			1
Arkansas		1						4	1		6
California	1	1	1			3					6
Colorado		2				1		5			8
Connecticut	1		1				1	1			4
Delaware		1						1			2
District of Columbia	24	107	64	17	83	49	12	86	17	31	490
Florida			1			2		1			4
Georgia						1		1	1	1	4
Idaho						1		1			2
Illinois		5	4		1	13	1	13		1	38
Indian Territory								1			1
Indiana	1	7	1			5	1				20
Iowa	2	3	1			3		6	3		18
Kansas		2				2	2	4		1	11
Kentucky	1	1	2			4		12		1	21
Louisiana						5		2			7
Maine			2					3			5
Maryland	8	8	17	5	4	12	2	18	6	6	86
Massachusetts	4	1			2	6	1	15			29
Michigan		3	1	1		6	1	7			19
Minnesota	1	3	2			3		2			11
Mississippi	1					1	1	6			9
Missouri		3	1			3	3	5	3	1	19
Montana							1	1			2
Nebraska			1			2	1	4			8
New Hampshire	1	3	1			2		5			12
New Jersey	1	1	1	1	1	4	1	6			17
New York	5	5	4		1	10	5	21		2	53
North Carolina	1	2	2			6		3		1	15
North Dakota			1			1					2
Ohio	3	10	2			5	1	19		1	41
Oklahoma	1	3				3				1	8
Oregon		1		1							2
Pennsylvania	6	10	13	3	3	21	4	33	3	1	97
Rhode Island		1	1			1	2	1			6
South Carolina		2	1			4	1	2			10
South Dakota		1	2			1	1	3			8
Tennessee	3	1				2		7	1		14
Texas	1	2				3		6		1	13
Utah			1				2	5		1	13
Vermont	1	1				1		3			6
Virginia	3	12	0	2	3	23	5	21	7	15	100
Washington	1	1	1			1		6			10
West Virginia		2				3	1	3			10
Wisconsin		5	1	1		2	1	7			17
Wyoming			1								1
Total United States	71	214	138	33	98	220	51	359	42	68	1,294

GEOGRAPHICAL DISTRIBUTION OF STUDENTS—Continued.

Foreign countries.	G. S.	C. C.	W. C. E.	Arch.	Teach.	Med.	Dent.	Law.	P. & D.	Phar.	Total.
Australia			1								1
China			1				1				2
Corea			1								1
Costa Rica							1				1
England				1							1
Finland						1					1
Germany	3	1	1							3	8
Hawaii						1		1			2
Mexico			1						1		2
Nova Scotia								2			2
Peru				1							1
Porto Rico			1					2			3
Philippines								1			1
Russia						1					1
Uruguay						1					1
Total foreign countries	3	4	3	2	...	5	1	6	1	3	28
Total United States....	71	214	138	33	98	220	51	359	42	68	1,294
Grand total.....	74	218	141	35	98	225	52	365	43	71	1,322

RECAPITULATION.

MEMBERS OF THE FACULTIES AND TEACHING STAFF:

Professors	85
Assistant Professors	27
Instructors, Demonstrators, and Assistants.....	72
Lecturers	16
Librarians and Assistants.....	8
Total	208

STUDENTS:

Graduate	76
Undergraduate	492
Professional	754
Duplicates	1322
Total	30
Total	1292

STUDENTS IN THE UNIVERSITY.

241

DEPARTMENT OF ARTS AND SCIENCES:	Faculty.	Students.
Faculty of Graduate Studies	41	74
Columbian College	40	218
Washington College of Engineering....	28	141
Division of Architecture.....	24	35
In attendance upon the Courses for Teachers	13	98
	— 146 —	566
FACULTY OF MEDICINE:		
Department of Medicine.....	81	225
Department of Dentistry.....	37	52
	— 118 —	277
DEPARTMENT OF LAW.....	20	365
DEPARTMENT OF POLITICAL SCIENCES.....	23	43
NATIONAL COLLEGE OF PHARMACY.....	10	71
	—	—
Totals	317	1322
Duplicates	109	30
	—	—
Totals	208	1292

Degrees Conferred.

DEGREES CONFERRED AT COMMENCEMENT, 1906.

IN COURSE.

Doctor of Philosophy.

Cornelius Lott Shear, Maryland.

B.S., 1896, M.S., 1900, University of Nebraska.

Martin Norris Straughn, Maryland.

B.S., 1899, Maryland Agricultural College.

M.S., 1902, Columbian University.

Master of Arts.

Augusta Moulton De Forest, Kansas.

B.A., 1905, The George Washington University.

Maud Esther McPherson, Illinois.

B.A., 1905, The George Washington University.

Walter Clement Shields, Pennsylvania.

B.A., 1904, Moravian College.

Nellie Scribner Spencer, District of Columbia.

B.A., 1901, Hiram College.

Mary Elsie Turner, District of Columbia.

B.A., 1902, Columbian University.

Master of Science.

Harry Coope, Ohio.

M.P.L., 1901, Columbian University.

B.S., 1905, The George Washington University.

Sheldon Heber Graves, Vermont.

B.S., 1904, Columbian University.

George William Hoover, Oklahoma.

B.S., 1903, Oklahoma Agricultural College.

Donald Francis McDonald, Washington.

B.S., 1905, University of Washington.

Frederick Denison Owen, Connecticut.

B.S., 1905, The George Washington University.

Civil Engineer.

Edwin Vivian Dunstan, Virginia.

B.S. in C.E., 1905, The George Washington University.

Oscar Alexander Mechlin, District of Columbia.

B.S., 1903, Dartmouth College.

Electrical Engineer.

Charles Nichols Gregory, New York.

B.S. in E.E., 1905, The George Washington University.

James Muscoe Matthews, Virginia.

B.S. in E.E., 1905, The George Washington University.

Mechanical Engineer.

Frederick Wilhelm Albert, Pennsylvania.

B.S. in M.E., 1905, The George Washington University.

Bachelor of Arts.

Clara Velma Barber, Florida.

Karl Morgan Block, District of Columbia.

Ada Belle Burgdorf, District of Columbia.

August Frederick Wilhelm Edler, Germany.

Frances Elma Gillespie, Texas.

Ethel Hanna McCleary, District of Columbia.

Marion Elizabeth McCoy, North Dakota.

Charlotte Reinke, Texas.

Dorothea Foote Sherman, Virginia.

Louise Jane Smith, West Virginia.

(With distinction)

William Webb Sniffin, District of Columbia.

(With distinction)

Clella Lucile Stevens, Pennsylvania.

Adèle Ria Taylor, New York.

Rhoda Watkins, Pennsylvania.

(With distinction)

Clarence Willard Whitmore, District of Columbia.

Ruth Bell Young, Virginia.

Bachelor of Science.

Howard De Cort Crocker, Virginia.

Katherine Harrington, District of Columbia.

Stephen Elliott Kramer, District of Columbia.

William Henry Lawton, District of Columbia.

Margaret Agnes McMahon, New York.

Elonzo Tell Morgan, West Virginia.

Adon Daniel Phillips, New York.

Bachelor of Science in Chemistry.

Harry Wilson Houghton, Maryland.

Edwin Smith, Jr., Maryland.

Bachelor of Science in Civil Engineering.

Silas Virginius Kemp, Maryland.
 Frank Tremain Miller, Michigan.
 Arthur Ducat Stivers, Missouri.

Bachelor of Science in Electrical Engineering.

John Hanson Boyden, Virginia.
 James Murray Drysdale, Colorado.

Doctor of Medicine.

Julius Leo Arntzen, Missouri.
 Samuel Lee Battles, Louisiana.
 Robert Anderson Bennett, Maryland.
 Nelson Du Val Brecht, District of Columbia.
 Ernest William Brown, Connecticut.
 Ph.B., 1897, Ph.D., 1900, Yale University.
 William Barry Burnell, Oregon.
 Fontaine Lee Carswell, Georgia.
 Lyman Jairus Clements, Mississippi.
 John Sullivan Clifford, New Hampshire.
 James Daniel Currie, Texas.
 Alfred Preston Davis, North Carolina.
 M.D., 1894, Kentucky School of Medicine.
 Meade Randolph Edmunds, Mississippi.
 James Steele Forsythe, Mississippi.
 Ralph Montgomery Goss, Georgia.
 A.B., 1901, University of Georgia.
 James Robertson Gow, Ohio.
 L.I.B., 1894, Georgetown University.
 Charles Shober Grayson, North Carolina.
 Kosciusko Hamilton, Tennessee.
 William Slaughter Hardesty, West Virginia.
 Roy Cleveland Hefebower, District of Columbia.
 Paul Stanley Hill, Maine.
 B.A., 1901, Bowdoin College.
 Robert Arthur Hooe, Virginia.
 Levi Houston Huber, Pennsylvania.
 John William Humphries, Virginia.
 H. Christian Jorgenson, New York.
 Ph.G., 1898, New York College of Pharmacy.
 Lyman Frederic Kebler, Pennsylvania.
 M.S., 1892, University of Michigan.
 Anthony Joseph Lanza, New York.

- John Royer Laughlin, Pennsylvania.
 M.A., 1902, Columbian University.
- Herbert Z. Lund, Utah.
- Larry Benjamin McAfee, Indiana.
- William Nelson Mebane, North Carolina.
- Carroll Sewall Middleton, Maryland.
- Herbert Bridger Montgomery, Ohio.
- Mead Moore, Kentucky.
- Lester Hughes Murdoch, Texas.
- Hugh Nutting, New York.
- Arthur F. Reeves, North Carolina.
- Fred Repetti, District of Columbia.
 Phar.D., 1901, National College of Pharmacy.
- William Lloyd Sheep, North Carolina.
- Charles Augustus Simpson, Virginia.
- Stephen Harrison Smith, Virginia.
- William Hamilton Smith, Jr., District of Columbia.
- Richard Lee Spire, New York.
- Arthur Camp Stanley, Wisconsin.
- Charles Fague Sterne, District of Columbia.
- Earle Clement Stevenson, Nebraska.
 B.S., 1899, Nebraska Wesleyan University.
 M.A., 1903, University of Nebraska.
- Dallas Gilchrist Sutton, District of Columbia.
- Arthur Newman Tasker, District of Columbia.
 A.B., 1902, Wesleyan University.
- Joseph Peterfield Trent, Virginia.
- Carl Warren Woods, Vermont.

Doctor of Dental Surgery.

- Adolphus Blair Ake, Pennsylvania.
- Roy Clay Brittin, Tennessee.
- Nathaniel Chapman, District of Columbia.
- Ralph Stuart Clinton, New York.
- Marion Edwyn Harrison, Georgia.
- Upton S. Howser, Maryland.
- Don Francis Murphy, District of Columbia.
- Frank Elton Neely, Indiana.
- James Thomas Prendergast, West Virginia.
- John Winslow Taylor, Maryland.
- Ralph Ivey Vandewall, Wisconsin.
- William Henry Woodruff, New York.

Doctor of Pharmacy.

- Louis V. Dieter, Maryland.
 Alice Winans Downey, Ohio.
 Isadora Geoghegan, District of Columbia.
 John W. Grady, South Carolina.
 Bernard S. Judd, District of Columbia.
 Frank T. Linton, Maryland.
 Harry S. McAuley, District of Columbia.
 Robert R. Miskimon, Delaware.
 Cyrus W. Nelson, Iowa.
 Nellie G. O'Donnell, District of Columbia.
 Helen A. Sudler, Illinois.

Doctor of Civil Law.

- John William Farley, Tennessee.
 LL.B., 1902, Vanderbilt University.
 LL.M., 1903, M.Dip., 1904, Columbian University.
 Albert Cornelius Gaw, Missouri.
 B.A., 1894, M.A., 1901, William Jewell College.
 M.A., 1896, Gallaudet College.
 M.Dip., 1904, The George Washington University.
 Howard Saxton, Nebraska.
 LL.B., 1901, University of Nebraska.
 LL.M., 1904, Columbian University.
 M.Dip., 1905, The George Washington University.

Master of Diplomacy.

- Clarence Alfonso Miller, Missouri.
 LL.B., 1899, Kansas City School of Law.
 LL.M., 1905, The George Washington University.

Master of Laws

- Frank Coy Allis, New York.
 LL.B., 1903, Cornell University.
 James L. Bruff, New Jersey.
 LL.B., 1903, University of Virginia.
 Walter Clark, North Carolina.
 LL.B., 1905, University of North Carolina.
 Branner Gilmer, North Carolina.
 LL.B., 1905, University of North Carolina.
 William Kingsley Williams, Wyoming.
 B.A., 1900, Yale University.
 LL.B., 1902, University of Nebraska.

Master of Patent Law.

- George Lowman Beeler, Illinois.
B.S., 1899, Columbian University.
LL.B., 1902, National University.
- Edgar Hamilton Bon Durant, Iowa.
LL.M., 1903, National University.
- Walter White Boughton, Ohio.
LL.B., 1905, National University.
B.S., 1902, Case School of Applied Science.
- Noah J. Brumbaugh, Missouri.
B.A., 1896, Harvard University.
LL.B., 1904, National University.
- John Henry Carnes, New Jersey.
LL.B., 1904, National University.
- Durant Church, District of Columbia.
LL.B., 1905, Notre Dame.
- Nathan Comstock, Wisconsin.
LL.B., 1900, University of Wisconsin.
- Richard John Cook, Arkansas.
LL.B., 1905, National University.
- Clair Wesley Fairbank, Minnesota.
B.S., 1904, Columbian College.
LL.B., 1905, National University.
- George Alexander Hutchinson, District of Columbia.
LL.B., 1905, The George Washington University.
- Wylie Churchill Margeson, Michigan.
B.A., 1897, Harvard University.
LL.B., 1903, University of Minnesota.
- Edmund Quincy Moses, Massachusetts.
B.S., 1902, Harvard University.
LL.B., 1905, The George Washington University.
- Minott Eugene Porter, Ohio.
C.E., 1898, University of Michigan.
- Charles Henry Shaffer, Maryland.
B.S., 1896, St. John's College.
LL.B., 1905, The George Washington University.
- William John Sperl, Massachusetts.
LL.B., 1905, The George Washington University.
- Adolph Alexander Thomas, Ohio.
- Frederick Transom, Pennsylvania.
B.S., 1895, University of Pennsylvania.
- Lineas Dott Underwood, District of Columbia.
B.S., 1899, Columbian University.
- Arthur Wright, Maryland.
B.A., 1900, Johns Hopkins University.

Bachelor of Laws.

- Levi Russell Alden, District of Columbia.
A.B., 1903, A.M., 1904, Columbian University.
- Ernest Patterson Armstrong, Iowa.
LL.B., 1902, National University.
- Carlos Ashby Badger, Utah.
- John Richard Barker, North Carolina.
- Harry R. Barton, South Dakota.
- Glenarvon Behymer, California.
- Adam M. Beeler, Indiana.
- Riley Andrew Blessing, West Virginia.
- Charles Norman Bouic, Maryland.
- Marcus Henry Burnstine, District of Columbia.
- Simon Henry Busch, Minnesota.
- David Hazen Butz, Pennsylvania.
B.A., 1895, Lafayette College.
- Morton Mead Cheney, New Hampshire.
- Frederick Francis Clark, District of Columbia.
- Arthur Henry Codington, Georgia.
LL.B., 1902, Mercer University.
- Charles Buxton Coffin, South Carolina.
- Louis Cohen, Wisconsin.
- Levi Cooke, New York.
- Percy Murtaugh Cox, Maryland.
M.D., 1899, Columbian University.
- Lucien Bainbridge Crist, District of Columbia.
- Victor George Croissant, Washington.
- Arthur Emerson Cross, Washington.
LL.B., 1905, University of Washington.
- John Benedict Cunningham, West Virginia.
- Berkeley Reynolds Davids, Pennsylvania.
- Herbert King Davidson, Jr., Massachusetts.
- Arthur Llewellyn Davis, Illinois.
- Jasper Marion Dresser, Pennsylvania.
B.S., 1890, Purdue University.
- Arthur Ames Fisher, District of Columbia.
- Allen Gilbert Flowers, South Carolina.
- Frank Frayser, Virginia.
- Harvey Ford, West Virginia.
- Edwin Winfield Fullam, New Jersey.
- Charles Franklin Fuller, New York.
B.S., 1901, The George Washington University.
- Walter Louis Furbershaw, New York.
- Philip Manly Garnett, New Hampshire.

- Horace Reid George, Pennsylvania.
 Milo B. Goodall, Wisconsin.
 Morris K. Harralson, Georgia.
 Elmont Bibb Hazard, District of Columbia.
 Lewis Hodges, District of Columbia.
 Sumner Webster Hurd, New Jersey.
 Willie Parker Jones, Massachusetts.
 B.A., 1898, Tufts College.
 Walter Edwin Keyes, Oregon.
 LL.B., 1905, Oregon University of Law.
 Harry Ferdinand Lerch, District of Columbia.
 Leroy Aylmer McGee, Wisconsin.
 Donald Holman McLean, New Jersey.
 Tom Crane McNamee, South Dakota.
 John Wilfred Mahon, Ohio.
 Herbert Walter Meyers, Maryland.
 Alexander Gordon Milhado, District of Columbia.
 Donald Cassius Muhleman, District of Columbia.
 Charles Wesley Morris, District of Columbia.
 Henry Farwell Munn, District of Columbia.
 Albert Boyd Neal, Tennessee.
 Alvin Leroy Newmyer, District of Columbia.
 John Thomas Nixon, New Hampshire.
 George W. Parsons, Michigan.
 Francis John Phillips, New York.
 James Hardy Price, South Carolina.
 Richard John Francis Quigley, New York.
 Edward Leckey Reed, Ohio.
 William Levengood Rhoads, Pennsylvania.
 Daniel Judson Richardson, New York.
 Ph.B., 1903, Syracuse University.
 Charles Francis Riddell, Washington.
 A.B., 1901, Leland Stanford University.
 Eldon E. Sams, Iowa.
 Ph.B., 1897, Nebraska Wesleyan University.
 Franklin Oliver Sanders, Pennsylvania.
 John Carlisle Sell, District of Columbia.
 Leonard G. Shelton, Mississippi.
 B.S., 1901, Mississippi Agric. and Mechanical College.
 Arthur Charles Shepherd, Wisconsin.
 Alva Hamilton Shipper, West Virginia.
 James T. Simpson, New Hampshire.
 Paul Edwin Sleman, District of Columbia.
 Walter Allwood Sommers, New York.
 LL.B., 1905, St. Lawrence University.

David Judson Starr, Ohio.
Morris Stern, Wisconsin.
Frank Stetson, District of Columbia.
Edwin Allan Swingle, District of Columbia.
Giles Russell Taggart, New Jersey.
 B.S., 1900, Columbia University.
Myron Winfield Tilden, Connecticut.
Therrett Towles, District of Columbia.
Horacio Walker, Chile.
William James Wallis, New Hampshire.
 B.A., 1894, Dartmouth College.
 A.M., 1899, Columbia University.
Fred William Weitzel, Kentucky.
James Dawson Williams, Maryland.
 B.A., 1902, Western Maryland College.
Grover C. Wilmoth, Texas.
Walter Orr Woods, Kansas.
William Herbert Woodwell, New Hampshire.

DEGREES CONFERRED AT FALL CONVOCATION, 1906.

IN COURSE.

Doctor of Medicine.

Charles Alben Harrison, Illinois.

Doctor of Pharmacy.

Milton L. Goldsmith, District of Columbia.
Daniel J. Mattingly, Maryland.

Bachelor of Laws.

Leonard Weer Groomes, Maryland.
Alfred Bryan Leet, District of Columbia.
James Cheetham Smith, Pennsylvania.
Wilson Eardley Wilmot, New York.

Master of Laws.

John Cooke Brooke, Virginia.

DEGREES CONFERRED AT WINTER CONVOCATION, 1907.

HONORARY.

Doctor of Laws.

Oscar Terry Crosby, District of Columbia.

IN COURSE.

Doctor of Philosophy.

Warner W Stockberger, Ohio.

B.S., 1902, Denison University.

Thesis: The Effect of Certain Toxic Solutions on Nuclear and Cell Division in Root Tips of *Vicia Faba*.

Master of Arts.

August Friedrich Wilhelm Edler, Germany.

B.A., 1906, The George Washington University.

Thesis: The Foreign Policy of Frederick the Great.

Master of Science.

Walter Cox Taber, California.

B.A., 1898, Leland Stanford, Jr., University.

Thesis: The Solubility of Mixed Oxides of Calcium and Copper in Aqueous Solution of Phosphoric Acid.

Bachelor of Arts.

Angus McDonald Crawford, Virginia.

Doctor of Medicine.

Gerald van Casteel, Maryland.

LL.B., 1899, LL.M., 1900, Georgetown University.

Doctor of Pharmacy.

Frederick C. Bennett, England.

Addie P. S. Criswell, District of Columbia.

Bernard B. Larrick, Virginia.

Agnes M. Nordeman, Illinois.

Helen Hazel Nordeman, Illinois.

Bachelor of Laws.

Charles Doty Voorhis, New Jersey.

Master of Diplomacy.

Roscoe J. C. Dorsey, Pennsylvania.

LL.B., 1902, LL.M., 1903, Georgetown University.

Thesis: The Growth of the National Banking System under the Currency Act of March 14, 1900.

Doctors of Philosophy.

During the years 1894 to 1907, inclusive, the University has conferred the degree of Doctor of Philosophy, after examination and the presentation and public defense of a thesis, upon the following persons:

1894.

- Edward Farquhar,** (Greek)
Thesis: *Elements of Unity in the Homeric Poems.* (Conservative Review, vol. iii, June-September, 1900.)
- Walter Scott Harshman,** (Theoretical Astronomy)
M.S., 1892, Columbia University.
Thesis: *Investigation of the Motion of the Pericentre of Deimos.* (Astronomical Journal, Boston, vol. xiv, pp. 145-148, 1894.)
- Professor Frank Hall Knowlton,** (Botany)
B.S., 1884, M.S., 1887, Middlebury.
Thesis: *The Flora of the Laramie Group and Allied Formations.* (Not published.)
- Claude Augustus Oscar Rosell,** (Chemistry)
M.A., 1881, University of Pennsylvania; LL.B., 1886, Georgetown University.
Thesis: *Investigation of the Properties of Ferric Acid.* (J. Am. Chem. Soc., vol. xvii, pp. 760-769, 1895.)

1895.

- George Wesley Hamner,** (History)
B.A., 1882, M.A., Hiwassee College; LL.B., 1885, University of Alabama; LL.M., 1886, Georgetown University.
Thesis: *Researches upon the Government of the Creek Indians.* (Not published.)

1896.

- Edward Clarke Hudson,** (Greek)
B.A., 1884, M.A., 1894, Hiwassee College; M.A., 1894, Columbia University.
Thesis: *Investigation into the Use of the Genitive Case in Greek.* (Not published.)
- Rev. James Stephen Lemon,** (Psycho-physics)
B.A., 1864; M.A., 1867, Wesleyan University, Middletown, Conn.
Thesis: *The Skin Considered as an Organ of Sensation.* (Published separately, 1898, 70 pp.)

1897.

- Professor Charles Arthur Hollick,** (Palæobotany)
Ph.D., 1879, Columbia College.
Thesis: *Palæobotany of the Yellow Gravel at Bridgeton, N. J.* (Not published.)

John Scott Johnson,

(Philosophy)

B.S., 1893; M.A., 1894, Columbian University.

Thesis: The Influence of French Thought on the Formation of the Constitution of the United States. (Not published.)

Timothy William Stanton,

(Palaeontology)

B.S., 1883; M.S., 1895, University of Colorado.

Thesis: A Comparative Study of the Lower Cretaceous Formation and Faunas of the United States. (Jour. of Geology, pp. 1-49, September-October, 1897.)

1898.

Cabell Whitehead,

(Chemistry)

B.M., 1885, Lehigh University; M.S., 1895, Columbian University.

Thesis: A Study of the Tellurides; Their Formation and Chemical Properties. (G. W. U. Bull., 5 [4], 65-68, 1906.)

1900.

Eugene Byrnes,

(Physical Chemistry)

B.A., 1884, Michigan University; LL.B., 1887; LL.M., 1888, Columbian University.

Thesis: Experiments on the Direct Conversion of the Energy of Carbon into Electrical Energy. (Not published.)

Rev. Benjamin Alfred Dumm,

(Philosophy)

B.A., 1886; M.A., 1889, Western Maryland College.

Thesis: The Concept of Self in the Analysis of Experience. (Not published.)

Professor Charles Russell Ely,

(Chemistry)

A.B., 1891; A.M., 1897, Yale College.

Thesis: Investigation of the Phenomenon of Deliquescence and the Capacity of Salts to Attract Water Vapor. (G. W. U. Bull., 5 [4], 69-74, 1906.)

Ernestine Fireman,

(Chemistry)

M.S., 1898, Columbian University.

Thesis: The Action of Phosphorus Iodide on Tetra and Penta Chlorides. (Am. Chem. Jour., 30, 116-133, 1903.)

Charles Moore,

(American History)

A.B., 1878, Harvard; M.A., 1898, Columbian University.

Thesis: The Northwest under Three Flags. (Published separately by Harper & Bros., New York, 1900, 402 pp.)

1901.

William Hamilton,

(American History)

B.A., 1891, Moravian College, Pennsylvania; M.A., 1894, Columbian University.

Thesis: The Expansion of Russia to the Eastward. (Not published.)

Chohci Shirasu,

(Economics)

Graduate, 1893, Doshisha University, Japan; A.M., 1899, Yale University.

Thesis: The Development of Commerce in Japan and its Effect on Civilization. (Summary of Commerce and Finance for December, 1901, Bureau of Statistics, U. S. Treasury Department, pages 2227-2315.)

1902.

Rev. Frank Leighton Day, (Anthropology)
B.A., 1891; M.A., 1896, Roanoke College; B.D., 1895, Vanderbilt University.)

Thesis: Did the Semites Pass through a Totem Stage? (Not published.)

Nevil Monroe Hopkins, (Chemistry)
B.S., 1899; M.S., 1900, Columbian University.

Thesis: Some Experiments on Electrolytic Conductivity with Reference to the Ionic Theory. G. W. U. Bull., 3 [3], 91-94, 1904. (Published separately as "Experimental Electrochemistry," by D. Van Nostrand Company, New York, 1905, 284 pp., 131 ill.)

1903.

Edward Allston Hill, (Chemistry)
A.B., 1875; A.M., 1902, Yale University; M.S., 1901, Columbian University.

Thesis: The Constitution of Certain Halogen Oxyacids as inferred from Thermochemical Data. (G. W. U. Bull., 3 [4], 94-103, 1904.)

William Mather Lamson, (Architecture)
B.S., 1897; C.E., 1899, Columbian University.

Thesis: Iron and Steel Domes. (Not published.)

Thomas Malcolm Price, (Biochemistry)
B.S., Maryland Agricultural College; M.S., 1900, Columbian University.

Thesis: The Influence of Varying Strength Solutions of Formaldehyde on some of the Enzymes of Animal Origin. (G. W. U. Bull., 3 [4], 104-108, 1904.)

Harriet Richardson, (Zoölogy)
A.B., 1896; A.M., 1901, Vassar College.

Thesis: Contributions to the Natural History of the Isopoda. (Proc. U. S. Nat. Museum, 27, 1-89, 1904, and Bull. U. S. Fish Com., pp. 47-54, Sept. 17, 1903.)

1904.

William Macon Coleman, (History)
A.B., 1858; A.M., 1892, University of North Carolina.

Thesis: A Refutation of Mommsen's Theory on Caesar's Agrarian Policy. (Not published.)

Frank Van Vleck, (Mechanical Engineering)
M.E., 1884, Stevens' Institute of Technology.

Thesis: Improvements in Ship Construction. (Not published.)

Andrew Wilson, (American History)

B.S., 1885; B.O., 1886; B.A., 1886; M.A., 1890, Kansas Normal College; LL.B., 1890; LL.M., 1891, Georgetown University; M.L., 1892, D.C.L., 1893, Yale University.

Thesis: Influence of John Marshall on the Political History of the United States. (Not published.)

1905

Ray Smith Bassler, (Paleontology)
B.A., 1902, University of Cincinnati; M.S., 1903, The Columbian University.

Thesis: A Study of the James Types of Ordovician and Silurian Bryozoa. (Not published.)

Hiram Colver McNeil,

(Chemistry)

B.S., 1896; M.S., 1899, Denison University.

Thesis: On the Constitution of Certain Natural Silicates. (G. W. U. Bull., 4 [3], 76-79, 1905.)

Henry Albert Pressey,

(Hydraulic Engineering)

B.S., 1893, The Columbian University; B.S., 1896, Massachusetts Institute of Technology.

Thesis: Flow of Water in Channels. (Not published.)

Warren Waverley Phelan,

(Comparative Jurisprudence)

B.A., 1894; M.A., 1896, Columbia University.

Thesis: An Historical Sketch of the Criminal Law of Louisiana from the Founding of the Colony to the Establishment of the State. (Not published.)

1906.

Cornelius Lott Shear,

(Botany)

B.S., 1896; M.S., 1900, University of Nebraska.

Thesis: Cranberry Diseases. (G. W. U. Bull., 5 [4], 75-78, 1906.)

Martin Norris Straughn,

(Agricultural Chemistry)

B.S., 1899, Maryland Agricultural College; M.S., 1902, Columbia University.

Thesis: The Chemistry of Different Varieties and Individual Ears of Sweet Corn as affected by Enzymes, Climatic Conditions, and Breeding. (Not published.)

1907.

Warner W Stockberger,

(Botany)

B.S., 1902, Denison University.

Thesis: The Effect of Certain Toxic Solutions on Nuclear and Cell Division in Root Tips of *Vicia Faba*. (Not published.)

ALUMNI ASSOCIATIONS.

THE GENERAL ASSOCIATION.

*Officers, 1907.**President.*

EDWIN C. BRANDENBURG.

Vice-Presidents.

N. LANDON BURCHELL,
 DR. THEODORE N. GILL,
 DR. VIRGIL B. JACKSON,

FULTON LEWIS,
 WILLIAM A. MEARNS,
 JOHN B. SLEMAN, JR.

Secretary.

HOWARD L. HODGKINS,

Treasurer.

JOHN B. LARNER.

Executive Committee.

EDWIN C. BRANDENBURG, Chairman.

HOWARD L. HODGKINS, Secretary.

DR. GEORGE N. ACKER,
 DR. JOHN W. BURCH,
 N. LANDON BURCHELL,
 DR. JOHN W. CHAPPELL,
 MYER COHEN,
 DR. THEODORE N. GILL,
 JOHN W. HOLCOMBE,
 DR. A. BARNES HOOE,

DR. VIRGIL B. JACKSON,
 JOHN B. LARNER,
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The George Washington University Bulletin

JUNE, 1907

The George Washington University Movement

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GEORGE WASHINGTON'S DESIRE FOR A GREAT UNIVERSITY AT THE
CAPITAL OF THE NATION.

"It has been my ardent wish to see a plan devised, on a liberal scale, which would have a tendency to spread systematic ideas through all parts of this rising empire, thereby to do away with local attachments and state prejudices, as far as the nature of things would, or indeed ought, to admit, from our national councils. Looking anxiously forward to the accomplishment of so desirable an object as this is (in my estimation), my mind has not been able to contemplate any plan more likely to effect the measure than the establishment of a university. . . ."

George Washington In His Last Will.

"The Federal City from its centrality and the advantages which in other respects it must have over any other place in the United States ought to be preferred as a proper site for such a university."

George Washington's Letter to Commissioners.

"And so on this birthday of the Father of His Country I leave with you this thought: George Washington the testator, the people of the United States the executor, the bequest a university, its domicile this District, its field of toil the Republic, the reach of its ever-increasing influence and glory the boundaries of space and time."

Mr. Justice Brewer's Address at the George Washington University Convocation, February 22, 1905.

"Therefore, the objects of this movement are, to establish The George Washington University upon a commanding site given by the people of the District, with ample endowment furnished by the private benefactions of the people of the whole country, and thus to create the great University Washington and his associates desired to see established in the National Capital."

*Extract from Statement adopted by the
Citizens' Committee, March 11, 1907.*

The George Washington University BULLETIN

VOL. VI

JUNE, 1907

No. 2

THE GEORGE WASHINGTON UNIVERSITY MOVEMENT.

To share in this great work—the realization of George Washington's desire for a great university at the Capital of the Nation—all good Americans are invited. It is our purpose to build up in Washington an institution worthy of the name it bears. The promoters and adherents of The George Washington University Movement ask YOU to help to this end.

INTERNAL DEVELOPMENT OF THE UNIVERSITY.

This Movement to establish The George Washington University as a great non-sectarian institution on a private foundation began four years ago with the revision of its charter by Act of Congress. Its genesis is found in the efforts successfully exerted by President Needham to merge as far as possible under one corporation the agencies and facilities for advanced intellectual training already existing in Washington. Under its new auspices the internal development of the university has been marked. The Board of Trustees has been strengthened and its national character emphasized by the addition of men eminent in the financial, scientific, and professional life of the Republic. Greater unity has been attained by the consolidation of departments. An enthusiastic University spirit has been aroused in faculty and students. About forty professors and instructors, graduates of leading American universities, have been added to the teaching staff. The purpose is manifest in councils and faculties to measure up to the highest university standards and ideals. Evening classes have been given up, regular lectures beginning at 9:30 a. m. and closing at 6:30 p. m. Students who give but part of their time to the University have to devote from one to three years longer to secure their degrees than regular students. The libraries of the various departments have been greatly enlarged. Scientific publication on the part of instructors and graduate students has been stimulated. Methods of teaching have been improved, and standards of admission have been raised. Tuition fees in all departments have been increased. The response of the public to these organic improvements has been noteworthy, as is seen in the enhanced

prestige of the University and in an increase of over three hundred in the number of the students.

THE SITE FUND CAMPAIGN.

Though the new era in the history of the University began with the advent of the present administration, so modestly has President Needham done the work of reorganizing the University and planning its new career, that only within the past year has an earnest appeal been made to the public to come to our assistance financially. We have just begun to show to others the possibilities for advanced education in Washington through the development of our institution, and to call attention to the opportunities it affords for judicious educational investments. We have now entered upon a persistent campaign for funds and we shall not cease until through the generosity of the patriotic men and women of the Republic, we have sufficient equipment and endowment to make the University the peer of her American sisters.

The present financial campaign dates from November 14, 1906, when the formation of a committee now known as the Committee on Buildings and Endowment was formally authorized by the Board of Trustees upon recommendation of President Needham, and Professor Mitchell Carroll, of the University Faculty, was designated by them as chairman. The object of forming the Committee was to combine all efforts for raising money for the University under one controlling supervision and policy, and to undertake a campaign to secure by popular subscription sufficient funds to provide the necessary grounds and buildings and to afford adequate endowment for the educational work. The membership of the Committee was selected in the next few weeks, and on December 15 its first regular meeting was held and its organization was completed as follows:

Chairman: Mitchell Carroll.

Secretary: Frank L. Day.

Treasurer: Charles W. Holmes.

Thomas H. Anderson, Charles J. Bell, E. C. Brandenburg, John Joy Edson, James H. Gore, William B. King, John B. Larner, A. Lisner, H. B. F. Macfarland, Charles W. Needham, Hermann Schoenfeld, John B. Sleman, Jr., Charles D. Walcott, B. H. Warner, S. W. Woodward, Henry C. Yarrow.

Messrs. R. D. Harlan, Hennen Jennings, S. J. Peelle, and A. H. Snow were later added to this Committee.

The active work of the Committee began with the New Year. Realizing the large responsibilities it had assumed, the Committee determined to take one step at a time and, with its initial undertaking a success, then to proceed to larger things. There was a unanimous opinion that to enlist hearty support throughout the country we must first

of all show what the City of Washington would do for the University. Hence the Committee decided to take as its initial task the raising of \$200,000 at home for the erection of a building on the new site of the University. Shortly after this time the sale of the Van Ness Park site to the International Bureau of the American Republics, and the offer by the Dean heirs of "Oak Lawn," a beautiful estate at the intersection of Connecticut and Florida Avenues, made the question of the new site for the University the most important object of consideration. The Committee in consequence gave up its original plan and decided that its strongest possible appeal would be to ask the City of Washington to provide funds for the site, with the understanding that we should then look to the rest of the country for the endowment of the University.

The Dean property was offered for \$800,000, with two donations from the heirs of \$100,000 each. The late Theodore J. Mayer made a gift of about \$185,000 for a memorial building on condition that the Dean site be secured. Two other sites of greater acreage but of about the same value were also under consideration by the Board of Trustees. With the funds in hand from the sale of Van Ness Park, \$400,000 was the amount necessary to complete the purchase. It was decided to raise \$200,000 of this fund in a public campaign, and \$200,000 by private solicitation of people of large means.

To assist in the popular campaign a Citizens' Committee of one hundred and an Alumni Committee of one hundred or more were chosen. The membership of these committees is as follows:

CITIZENS' COMMITTEE.

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The Washington Site Fund Campaign was launched at a public meeting at the New Willard Hotel on the evening of February 25, when the matter of the site and the idea of the Greater University were presented by President Needham and other speakers. That evening \$81,500 were subscribed in less than an hour. For the next four weeks the Citizens, Alumni, Faculty, and Students' Committees were actively at work. A series of public meetings was held on Monday evenings in March at leading hotels at which speeches in advocacy of the movement were made and subscriptions were announced.

The Washington Site Fund has continued to grow steadily and on Commencement Day it was announced that it had reached the sum of \$150,075.20. President Needham's announcement on this occasion that the selection of the site must be postponed until more funds had been secured has quickened the determination of all concerned to bring this campaign to a successful conclusion. The committees are well organized, and early in October a second public campaign will be inaugurated with a view to raising the remaining \$50,000 of the popular subscription. There will be no cessation of activity on the part of the Committee on Buildings and Endowment until the initial task undertaken by it of raising \$200,000 from the City of Washington for the new site of the University has been successfully completed.

PLATFORM OF THE MOVEMENT.

In addresses made at the public meetings by President Needham, Mr. Justice Harlan, Mr. Justice Brewer, Mr. Justice Anderson, Rev. Drs. Hamlin, Radeliffe, and C. Ernest Smith, Hon. John Barrett, Rabbi Simon, and others, the George Washington University idea was made prominent, and this took form in a "Statement of Facts and Objects," prepared by Mr. C. A. Snow for the Citizens' Committee, and adopted at the meeting held at the Shoreham Hotel, March 11, 1907.

STATEMENT OF FACTS AND OBJECTS.

The Citizens' Committee of the District of Columbia, organized to further The George Washington University Movement, taking into consideration the various influences and interests throughout the country which are now working toward the establishment of a great University at the National Capital as intended by President Washington and his associates, to meet recognized educational needs, and believing that The George Washington University, by reason of the character of its organization, its history, and its position at the National Capital, is fitted to be such a University, hereby adopt and publish the following statement of facts and objects:

Origin and Evolution of the University.

The George Washington University is a corporation, the origin of which dates back more than eighty-six years. It is the successor of the Columbian College of the District of Columbia, which was chartered by special Act of Congress on February 9, 1821, with all the powers commonly granted to American colleges. By special Act of March 3, 1873, Congress recognized the Columbian College as a University by changing its name to the Columbian University. By special Act of Congress of January 23, 1904, the Columbian University was authorized, on compliance with certain formalities, to take a new name. These formalities were complied with, and on September 1, 1904, the present name was adopted. By special Act of Congress of March 3, 1905, Congress recognized The George Washington University by this name and conferred upon it additional powers of the most comprehensive nature for carrying on higher education.

Its Unique and Comprehensive Powers.

The powers of the University are unique, and, it is believed, are sufficiently broad to cover every phase of higher education at the National Capital. While it may, under its charter, carry on undergraduate instruction directly through its departments, the charter authorizes it to apply in whole or in part the English system of carrying on undergraduate work through colleges which are educationally under its jurisdiction. Such colleges are organized by permission of the University under a special incorporating act contained in the University charter. Each of such colleges has its own trustees, faculty, and financial foundation, separate and distinct from the University. All are, however, so under the jurisdiction of the University that they must conform to the standards set by it and can only present to it their candidates for degrees—all degrees being conferred by the University. It may carry on graduate work directly through its special University lecturers or through its departments, or, if found desirable, through colleges under its jurisdiction, and may give the proper degrees for graduate work. All the existing University systems may thus be applied by it in carrying on its work; and by this composite plan of organization, combining the advantages of a federal and a unitary system, the work of the University is standardized and coordinated, the time of the student economized, and the institution kept at the highest point of efficiency.

In addition to its power to permit the incorporation of colleges in the District of Columbia which are educationally under its jurisdiction, the University is authorized to affiliate with itself institutions of learning outside the District, which may desire to have the benefit of University affiliation.

Its Non-Sectarian Character.

The provision of the original charter of 1821 upon this subject was subsequently repealed, and a denominational provision was inserted. By Act of Congress of January 23, 1904, the denominational requirement was repealed, and the language of the original charter re-enacted. The provision reads as follows:

"Persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as president, professor, tutor, or pupil, be refused admittance into the University or be denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

Immediately after this last legislation, the Board of Trustees was reorganized so that no religious denomination has a control. This action was intended to signify, and does signify, that the University holds this provision to mean that the institution is forever to be non-sectarian.

This interpretation makes the charter accord with the expressed views of the framers of the Constitution and their associates. In the Constitutional Convention, James Madison and Charles Pinckney introduced, and James Wilson seconded, a resolution authorizing Congress to establish a University, "in which no preferences or distinctions should be allowed on account of religion." Washington, in his will, declared that he wished to see a University established in the District of Columbia, "on a liberal scale." President Monroe, in approving the original charter, said that it was "well digested," and that it "looks to the proper objects and grants the powers well adapted to their attainment."

Any attempt to make a sectarian institution of the University can be corrected by Congress, under its reserved power to alter or amend the charter.

The charter authorizes the establishment of a Board of Visitors, which may be representative of the interests of the country at large, and which will assure the observance of every provision of the charter.

Its Colleges and Departments.

The University has, in its various Faculties, over one hundred and sixty professors and teachers. It has thirteen hundred and fifty-eight students. It gives full day instruction in all its colleges and departments. Its undergraduate work in the arts and sciences is done by Columbian College, which, though bearing the name of the original institution from which the University has sprung, is nevertheless a corporation recently organized under the provisions of the charter of the University. Besides this college, there are two other undergraduate colleges, organized under the provisions of the University charter,—a College of Engineering and a College of Pharmacy. The possibility of giving undergraduate instruction through colleges under the jurisdiction of the University, on the broadest as well as on the most specific and practical lines, is thus illustrated. The graduate work of the University is done through a Graduate Department of the Arts and Sciences, a Department of Medicine, a Department of Law, and a Department of Politics and Diplomacy.

The Department of Politics and Diplomacy is being organized as a College of the Political Sciences, carrying on undergraduate, graduate, and professional instruction in American history, politics, economics, finance, international law, and diplomacy.

Its Financial Condition.

The University owns real estate, securities, and equipment, estimated at one million five hundred thousand dollars, against which there is an indebtedness of about five hundred thousand dollars. The clear assets of the University, therefore, amount to approximately one million dollars, of which two hundred thousand dollars belong to Columbian College.

The University derives its income at present almost wholly from tuition charges. Therefore the running expenses, including the interest charges, necessarily exceed the income.

It is a remarkable fact that while in other institutions of like character the tuition fees pay on an average only fifty per cent of the running expenses, in this institution, owing to the careful financial management and the self-sacrificing spirit of the professors and teachers, these fees pay seventy-five per cent of these expenses, the institution at the same time maintaining as high a standard as any in the country, and doing work which receives full credit in the educational world.

Objects of the George Washington University Movement.

Organized on these liberal and generous lines, situated at the National Capital, established for eighty-four years on a lesser scale and for the last two years on the broader basis, The George Washington University has already begun to attract the attention of the country. The wealth of material for the use of students which already exists in Washington is increasing daily at a marvelous rate, and graduate students are more and more finding themselves compelled to do a great part of their work in this city. A great University, free from all sectarian or partisan control, led by men of wide experience and culture, will formulate this mass of material and, by systematizing it and rendering it available for students, will make Washington the great center for graduate study; and the University will thereby become an important factor in determining, by dispassionate discussion, sound principles of political and economic action. Such a University may also be a very useful instrumentality for harmonizing and unifying educational movements.* The undergraduate colleges will provide for the local needs, and will be sought by a great body of young men attracted to the National Capital, the great political and educational center.

George Washington and his associates in the Constitutional Convention realized that a great University, non-sectarian and non-partisan in character, exercising important functions in the life of the people of the whole country, organized under the power of Congress as the legislature of the District of Columbia, was a necessary and inevitable part of the National Capital. The plan of Constitution introduced in the Convention as a basis of action by Charles Pinckney, and which was used as the original draft of the Constitution, provided for a University at the seat of government, as an independent item. The Committee which reported the Constitution in its first form omitted this item, and Madison, in the Convention, moved to restore it. The Constitution was again referred to a Committee, and was reported back with this item omitted, but with the provision giving Congress exclusive power in the Federal District. Again the question was brought before the Convention by the resolution above referred to, introduced by Pinckney and Madison and seconded by Wilson, authorizing the

establishment of a non-sectarian University, and proposing to insert the provision among the specifications of the powers granted to Congress as the national legislature. Gouverneur Morris opposed the resolution, saying, "It is not necessary. The exclusive power at the seat of government will reach the object." The Convention accepted his view, thus adopting the principle that the University to be established at the National Capital should be organized by Congress as a corporation of the District of Columbia, under its powers as the legislature of the District and not under its powers as the national legislature. They feared, perhaps, lest a University wholly or principally supported by the national funds might not have that freedom of thought and action which are essential to the beneficent life and power of a University, and might, in times of political or religious excitement, be used by a political faction or a religious sect to disseminate ideas harmful to the Republic. They doubtless saw also, as Washington did, that a great educational corporation, supported wholly or almost wholly by the private generosity of the people of the country, established at the seat of government, would be able to render, and would render, great and peculiar services in many ways to the people of the whole country.

Washington, in speaking of a great University of the kind intended by the Constitutional Convention, declared that "the Federal City, from its centrality and the advantages which in other respects it must have over any other place in the United States, ought to be preferred as a proper site for such a University." In that part of his Will in which he made the bequest which he intended to be the beginning of an endowment of a great University in the District of Columbia, he declared that it had been his "ardent wish to see a plan devised, on a liberal scale, which would have a tendency to spread systematic ideas through all parts of this rising Empire, thereby to do away [with] local attachments and State prejudices, as far as the nature of things would or indeed ought to admit, from our National Councils," and which would enable the youth of the whole country to associate together at the Capital and "to acquire knowledge in the principles of politics and government."

The conclusion reached by the Constitutional Convention as to the necessity of making the University at the National Capital non-sectarian and non-partisan, was also reached by Congress in 1821, as the result of the debate in both Houses upon the bill for the charter of the Columbian College. The Senate, upon the insistence of certain Senators, inserted in the charter the non-sectarian provision above quoted. In the House a strong effort was made to insert a provision making certain high officials of the National Government *ex officio* members of its Board of Trustees and of a Board of Visitors, but, after a long debate, this attempt was defeated, doubtless on the ground that such a provision would give the institution a partisan character. President Monroe, approving the charter, said (as before in part quoted):

"The act of incorporation is well digested, looks to the proper objects, and grants the powers well adapted to their attainment. . . . This institution, if it receives hereafter the proper encouragement, cannot fail to be eminently useful to the Nation. Under this impression I trust that such encouragement will not be withheld from it."

There is, therefore, a recognized need, clearly felt and pointed out by Washington and his associates in the Convention, of a great University at the National Capital, to fulfill certain great and beneficent

functions in the life of the people of the whole country. It seems not too much to say that The George Washington University, existing under the Columbian College charter enlarged and broadened by the additional powers since conferred by Congress, to which the revered name of Washington has been attached by the consent and with the approval of Congress, was organized to be, is fitted to be, and is destined to be that University.

Therefore, the objects of this movement are, to establish The George Washington University upon a commanding site given by the people of the District, with ample endowment furnished by the private benefactions of the people of the whole country, and thus to create the great University Washington and his associates desired to see established at the National Capital.

NOTABLE TESTIMONIES TO THE GEORGE WASHINGTON UNIVERSITY MOVEMENT.

Early in April, Rev. Richard Davenport Harlan, D.D., LL.D., formerly President of Lake Forest College, was appointed by the Trustees Special Representative of the George Washington University Movement, and assigned the task of securing subscriptions for the Site Fund and for the endowment of the University from philanthropic men of wealth throughout the country. Dr. Harlan has enlisted the coöperation of a number of distinguished statesmen, jurists, public men, and leading educators, who have expressed their convictions as to the national importance of the efforts now being made to put our University on a broad foundation.

We quote letters from President Roosevelt and Secretary Cortelyou to President Needham, extracts from addresses made at the public meetings, and sentiments from letters addressed to Dr. Harlan,* as an indication of how impartial observers of educational needs and opportunities regard the plans for the development of the George Washington University as a great University for graduate work, specializing along those lines for which the Capital offers such unparalleled advantages.

President Roosevelt:

"Pray accept the assurance of my hearty sympathy in your work. I am delighted to learn that the chances are now so good for obtaining the necessary funds to put The George Washington University firmly on its feet. I congratulate you upon the work that the University has already done, and in common with all good citizens I wish you all possible prosperity in the future."

*These letters appear in full in Dr. Harlan's pamphlet entitled "Notable Testimonies to the George Washington University Movement," copies of which may be obtained by addressing Dr. Harlan or the Registrar of the University.

Vice-President Fairbanks:

"It is impossible to exaggerate the importance of the work in which you are engaged. I am a firm believer in the establishment of such a university as this in the National Capital. There will assemble young men of ability from all portions of the country to enjoy facilities for education which will be unequaled anywhere. They will not alone be able to enjoy the advantages afforded by the great libraries and be permitted to study at close hand the mechanism of the Government, but they will be brought into intimate touch and association with young men from all portions of the Republic, who will become factors in all of the professional, business, political, literary, and scientific walks of life."

Mr. Justice Brewer:

"In suggesting the peculiar conditions of The George Washington University and the grounds upon which it may well appeal to the support of the whole Nation, these matters impress me much:

"First, the business of the Nation is carried on at the Capital, and this refers not merely to its political activities but also to those of a scientific character. Here are the headquarters of the various departments by which in all directions the Government is administered, and the student who is attracted to the subject of governmental administration will find no better place for prosecuting his studies than in the center of these activities.

"Again, Washington is not merely the center of the internal activities of the Nation, it is also the place where are considered and determined the relations and dealings between this and all other nations. All diplomatic matters in which the United States is interested find their way to Washington for solution. All questions involving our business relations with other nations and their citizens are here presented. So that the student who has a thought of making International Law his study and work in life will have the closest insight into the actual workings of that law as this nation interprets and recognizes it.

"These are considerations which make a University in the Capital, properly constituted and organized, one of great attraction and value to certain classes of students. In a reflex way, the instructors, who should be the most learned and competent men of the day, pursuing their several lines of investigation and study, will be constantly furnishing to those engaged in these national and international activities the best thought of the world. This reflex action is as important from a national standpoint, as the direct benefit to students from a personal standpoint.

"In these respects, a University in Washington properly constituted

and equipped will not conflict with the work of other educational institutions, but will be pursuing a specific and separate field of labor, and one which rightfully appeals to the support of all the citizens of this Nation."

Mr. Justice Peckham:

"In regard to The George Washington University and its main object, the plan is one which ought to enlist the sympathies of all lovers of education. Considering the special circumstances that exist here in the Capital of the Nation, and which favor such an institution upon the broad lines mentioned, I think it would be one of the best things for the country at large to have such an institution in this city."

Mr. Justice Day:

"I have long shared the feeling that there should be at the National Capital one of the strongest and best institutions of Higher Education. No city in the country can rival Washington in especial advantages for such a University.

"The opportunities found here for the student in any branch of learning are unsurpassed in the assistance afforded by museums and libraries of the most comprehensive character. And, above all, I would place the inestimable privilege which a residence here gives to a student in the opportunity to observe the workings of his Government in the making and administration of the laws. The student of law will here find an opportunity to hear the best legal talent of the country in its court of final resort, and may hear the leading statesmen of the Nation in debate in the Senate and House.

"He will carry away not only the learning of the books, but the knowledge which comes from a near view of his Government in actual operation, information which should promote his patriotic interest in his country's welfare, making of him a better citizen as well as a scholar."

Speaker Cannon:

"The Nation's Capital is fast becoming the center of literary and scientific activity, and, with the advantages it enjoys, should not be behind in educational work. I see no reason why The George Washington University should not become one of the foremost institutions of learning in the world."

Secretary Root:

"There are many respects in which Washington furnishes a field for Higher Education absolutely unequalled by any other place in the United States.

"This is especially true of *Political Science, Jurisprudence, Diplomacy, and International Law*. The operations of a great Government here, with which a student can readily keep familiar, afford opportunities for a real understanding in these branches almost equal to those that a hospital furnishes to a medical student, or that travel brings to the aid of the study of geography.

"The National Government is making a strong and systematic effort now to limit appointments in the diplomatic and consular service to men of special fitness for such work. Of course that effort will be greatly promoted by having as many young men as possible educated and trained in the subjects with which such officers have to deal. The greater the class of trained men from whom we can draw for appointments in the foreign service, the more easily we can maintain a high standard in this service.

"I am, accordingly, much interested in the success of that department of The George Washington University."

Secretary Cortelyou:

"I am very glad to have this opportunity to commend heartily the movement that has been inaugurated to raise \$400,000 as a site fund for The George Washington University. As an alumnus of the University I naturally feel a personal interest in the success of such a movement. The citizens of Washington generally have shown their willingness to respond to the University's needs, and I am sure that this further appeal will meet with such a generous response that the broad and comprehensive plans for its development may be fully realized."

Secretary Taft:

"Washington is better adapted for the home of a university than any other city in the country. A really great university here would have its being in the national and cosmopolitan atmosphere of the Capital of the country, and at the same time would constitute a valuable leaven and influence for culture and learning in the political and social life of this city. It would be a compliance with the purpose of George Washington as outlined in his Will and would be a place where *Northern, Southern, Eastern, and Western influences would unite to form a national American spirit.*"

Secretary Garfield:

"The position of this University is unique, in that it offers an unusual opportunity for bringing together students from all sections of our country. Its work should increase the sense of unity and emphasize the national spirit, and should not only show to its students the opportunities which are before the man who devotes himself to public work, but, as well, the obligations which he owes to the Nation."

Secretary Straus:

"I am gratified to see the advanced step The George Washington University has taken to develop a great University for Graduate Work at the National Capital.

"The various governmental institutions, such as the Coast and Geodetic Survey, the Bureau of Standards, the Smithsonian Institution, the Supreme Court of the United States, the Library of Congress, and Congress itself, when in session, can all be availed of to the greatest advantage by the students of a university located in this city. No other city in the world has ready at hand such educational facilities in a concrete working shape as are found in this Capital.

"I am gratified to know that The George Washington University has planned its foundations upon broad lines, and I am sure, with the facilities that it will command, it will offer advantages of the very highest order, which no other university in the land, no matter how richly endowed, can supply."

Hon. James Bryce, the British Ambassador:

"Washington seems to possess several quite special advantages fitting it to be the seat of a great University. Unlike your other great cities, it does not feel the strain and pressure of commerce and manufacturing industries. It contains an unusually large number of residents—temporary during the sittings of Congress, or permanent—who are qualified to act as advisers in University matters, men with a diversified experience of public affairs and a wide knowledge of the whole country. As the Seat of Government, it draws to itself, more perhaps than any other city, persons of all types, of all stocks, of all interests. There is something truly metropolitan about Washington, and a great metropolis ought to find one of its chief ornaments and glories in an institution dedicated to the highest forms of education and research.

"As I gather that it is proposed to make the teaching of the Historical, Political, and Economic Sciences prominent in the scheme of instruction and to make liberal pecuniary provision for the pursuit of them, it seems worth while to add that no place could be so well fitted to give actuality to the study of those subjects, and to enable students to test theories and abstract doctrines by comparison with concrete facts, as is the spot where Congress sits, where the Supreme Court sits, where the great administrative departments are at work, and where a great deal of extra-official political activity goes on.

"Washington has already gained so much by the presence of a large number of distinguished scientific men that the addition to its society of a group of men eminent in History and Economics, such as the proposed University would bring to the city as professors, might well be deemed an important incidental benefit to the life of the Capital."

M. Jusserand, the French Ambassador:

"I join heartily in the good wishes for the success of that noble undertaking, the greater George Washington University. That you will reach your goal I do not doubt.

"Like a human being, a university, in order to succeed, must answer a need and adapt itself to circumstances.

"Now, the city in which The George Washington University is meant to develop is not famous for its trade; its industries enjoy no celebrity and the world has heard little of its agriculture and navigation. But famous is its Supreme Court, famous its Capitol, famous, I may say, its White House, very famous indeed. It is preëminently a city of magistrates and statesmen, representatives of eternal Justice and of the (not perhaps quite so immutable) will of the people.

"These are striking conditions, and your intention to fit the University more and more exactly to them is certainly a move in the right direction. Universities must, to be sure, produce all sorts of men; but it is quite natural that each university should pay more attention to one special kind of knowledge. Let other universities choose, as their specialty, literary training, scientific training, or commercial training; The George Washington University cannot hesitate and has no choice:—it will become famous and be of use to the country as a nursery of magistrates, statesmen, and diplomats. . . .

"As a friend and guest of this city, and of this Republic, I can form no better wish for your University than this: May it be as successful as the "*École des Sciences Politiques*" has been in France; may it prove as useful to the United States in their prosperity as it was to us, "*patria tempore iniquo*."

Hon. John W. Foster, Ex-Secretary of State:

"From almost every point of view the full equipment of a great University at the Capital of the Nation, especially for post-graduate studies, is highly desirable. It will prove particularly appropriate and useful in its department of Politics and Diplomacy. For such a school no other locality in the country can offer such facilities and incentives. The great libraries located here, both general and special, the different departments of government serving as object lessons, the sessions of Congress, and the opportunities for contact with the diplomatic corps, make Washington the ideal place for a school of Politics and Diplomacy.

"I have long felt that some one of our men of wealth could not do a more patriotic or useful act than to endow such a school, in connection with The George Washington University, and thus worthily perpetuate his name as no other provision of his fortune could."

Hon. Andrew D. White, Ex-President of Cornell University:

"I have long believed that the next great institution of learning founded in the United States should be at Washington.

"Years ago I published a series of articles in the *Forum* to call attention to the enormous wealth of books, laboratories, collections, and illustrative material generally available for such a University to be found in our Capital City, and the time which has passed since then has only strengthened the conclusions at which I then arrived—so much so that I presented the subject again in two recent addresses at Washington, one before the Cornell Alumni Association, and the other in the presence of a large number of leading citizens of Washington.

"I quite agree with President James in his statement that a University at Washington would have certain advantages and could do certain most valuable work for the country which no other single institution could do.

"But my main reason for desiring to see the establishment of a University in that city is that it would draw together a very large attendance of students from North and South to understand each other, and to form those student friendships which would do more than anything else in putting an end to any estrangement that may still linger between North and South.

"Under these circumstances, I wish you all success, and most heartily commend the effort which you represent to the American people."

Hon. H. B. F. Macfarland, Commissioner of the District of Columbia:

"We have George Washington for our spiritual father, and so have a right to bear his great name. *We are aiming to obey his last command to establish a great University at the National Capital that will be worthy of the Nation which he created. . . .*

"We are confident that the University—now so strong, with its fine Faculty, its 1600 students, its unexampled spirit, and all the opportunities of the National Capital, the natural place for a university and for research work, and already rich in the good will of this community in which it is located—will have the sympathy and support of patriotic and public-spirited Americans everywhere. The interest in the National Capital and the desire of the people of our country everywhere to see that Capital developed and embellished will not be ignored in the case of this University. The national life, informed and inspired by it, must find the crown of its expression at the National Capital and in a University national in its scope, where ardent students, from all over the country, may behold 'the bright face of Truth in the quiet and still air of delightful studies.'"

Hon. John Barrett, Director of the International Bureau of the American Republics:

"Having been a United States minister in many different countries, I have, of course, listened to a great variety of comment on American civilization, American institutions, and our American Capital, the City of Washington.

"It is remarkable, in view of the present movement to promote the interests of The George Washington University, that everywhere in foreign lands I have heard surprise expressed that there was no great University in the Capital of the United States. We have little idea how well-known this city is among foreign peoples. In many parts of the world, where the names of New York, Boston, and Chicago are never spoken, there is knowledge of the Capital City, named after the first man of this country.

"The name of George Washington is one with which to conjure in all portions of the world. It carries a magical significance, not only in Japan and India, but in Africa and South America. A city, therefore, and an institution that are named after the Father of His Country are expected to be the best that the country in which they are located can produce. . . .

"I venture to say, therefore, that were The George Washington University, to-day, an institution known far and wide, it would have among its throngs of students no small proportion from South America, Europe, Asia, and Australia.

"What better influence could there be to strengthen our prestige and standing abroad than to have in attendance at The George Washington University representative young men from all the leading countries of the world, and especially from those which are looking to us to set them an example?

"Let us, therefore, though the hour is late in the history of the United States, make up for the deficiency of the past and provide at the Capital the opportunity for Higher Education that is expected in other parts of the world."

Secretary Walcott of the Smithsonian Institution:

"I have long believed in the development of a University in Washington that would take full advantage of the unique opportunities offered by the Government bureaus for the special training of post-graduate students in all branches of Science. . . .

"Congress has enacted that the vast collections and resources at the command of the Government shall be available for Higher Education and research, but it has not provided the machinery for making them practically available. As in the case of grants of land to colleges, Congress provides facilities and indirectly the means, but it

leaves to other agencies the task of devising ways and means to make them practically useful.

"I think that the present movement has great promise, and that if this work can be developed under The George Washington University it will result in the advancement of Higher Education throughout our country, and provide the Government and all educational institutions with a body of well-trained men that will be of the greatest service in the upbuilding and strengthening of our civil and educational institutions."

President Pritchett of the Carnegie Foundation for the Advancement of Teaching:

"It has given me pleasure to learn of the definite effort being made to develop The George Washington University into a strong University at the Capital.

"Most men connected with Education in the United States realize that we have in many parts of our country more colleges and universities than can be well sustained; but from my knowledge of the situation in Washington, I feel sure that Washington presents to-day a unique opportunity and an unusual field for university effort.

"There could be no more wholesome influence in our National Capital than would be furnished by the intellectual and moral atmosphere of a strong University. Furthermore, the facilities of the Government itself supplement in the most effective way the work which a university desires to do. An ever-growing constituency is furnished by the men drawn to Washington for various purposes, so that the building up of a strong University in Washington is not merely an addition of a new institution to those already existing, but it is the establishment of an intellectual center in a unique strategic position.

"Such an institution, not controlled by, but coöperating with the Government, ought to fill a real place in American Education."

President Faunce of Brown University:

"I have always believed that Washington has advantages above all other cities in this country for the development of graduate study. While steadily opposing the idea of a University supported and controlled by the National Government, I have as steadily maintained that some day we should see in Washington a collection of graduate schools which would do honor to the Nation and furnish immense stimulus to research in every field of human knowledge.

"The plans of President Needham are broad, statesman-like, and thoroughly feasible. The new site chosen is one of rare beauty and commanding outlook. A university in Washington can do for the Southern States what no Northern university can achieve. A univer-

sity in Washington would tend to unify all the Higher Education of the country."

President James of the University of Illinois:

"I regard this as an exceedingly important undertaking, and I believe you may conscientiously urge it upon the attention of every American citizen as one of the important projects in the field of Higher Education in which he ought to be personally interested.

"I do not see how any one can go over the history of the movement for the establishment of a great University in the Federal Capital without becoming convinced that it is destined to succeed. It is simply a question of whether the time has yet arrived. I believe it is *at hand*, and I am sure that every many who can contribute to the realization of this great project may feel that he has been helpful in a great service to this Nation."

President Thwing of Western Reserve University:

"The George Washington University Movement seems to me of the utmost importance for the interests of the Higher Education, and also for those interests of this Nation and of this world which the Higher Education in the United States is set to serve. You ought to ask for an endowment of many millions of dollars. The Higher Education is costly, and the higher it is the more costly it is; but the results for civilization prove that the costliness is not excessive; for while there is a need in America, as in the world, of the lifting of the intellectual and the moral level of humanity, there is also dire need of great leadership. Great leadership the Higher Education promotes."

Mr. Joseph Wharton, Founder of Wharton School of Finance and Commerce, University of Pennsylvania:

"Having long been of opinion that there ought to be somewhere in this country at least one institution where persons could be trained for our consular and diplomatic service, I had expected the 'Wharton School of Finance and Commerce' to set up a course of instruction on that line, but this has not yet been done nor even commenced. If The George Washington University shall take up the task of such training, it *will no doubt be better done there than would be possible at any other place*, since the vast amount of information contained in the Government archives forms a mass of material which *can never be matched elsewhere*.

"... The special training which is so obviously and grievously needed as preparation for our consular and diplomatic service can be better given in Washington and by the proposed enlarged University than anywhere else. . . ."

Rabbi Abram Simon, of the Washington Hebrew Congregation:

"Every one seems agreed that now is the accepted time for the launching of a great University at the Capital of the Nation, as contemplated by George Washington and the fathers of the Constitutional Convention. To miss the present golden opportunity would be nothing short of a calamity.

"To impeach the farsightedness of George Washington is patriotically suicidal. There never was a more auspicious period in the life of the Capital than the one through which she is now passing. She is being clothed in the becoming purple of national distinctiveness. She is the very heart of national potencies. Greater things are yet in store for her. . . .

"George Washington's idea, as contained in his Will, of a great University at the Capital of the Nation, is not a mere slip of the pen, not a mere incident of a presidential campaign, not a mere emotional stress of a farewell benediction, but part of a great historic setting, part of a great historic movement. The desire, expressed by Washington, Jefferson, and the other fathers of the Republic, for a great University at the Capital of the Nation was the first legitimate offspring of the young Democracy. You cannot separate the two. Their destinies were born together in the birth-throes of the Revolution. . . .

"As powerful as may be the voice that speaks from Mt. Vernon, our Westminster Abbey, it is, after all, but a voice from the dead. As stirring as may be the towering pyramidal tongue of the Washington Monument, its sermon is preached in cold marble. But "*The George Washington University*" of the Nation will speak with living tongues, throbbing with living men and women, professors and pupils—all eloquent monuments to the undying memory of the first President of the United States, all virile and moving incarnations of the great Genius of American Democracy!"

Mr. John E. Parsons, of New York City:

"I herewith hand you a subscription towards the sum required to consummate the purchase of the new site for The George Washington University.

"I wish that it were in my power to give an amount which would correspond with my opinion of the importance of the scheme thus to carry out the purpose of President Washington as expressed in his last Will. In no more striking way could he have illustrated his opinion of the importance of the plan which he proposed than *that he should make provision for it in his last Will and Testament.*

"In the strain and press of this period of the country's growth it is easy to forget what we owe to Washington. His life and work made the whole world his debtor. That debt is universally recognized.

"What, then, should be thought of us if—when such an occasion as this offers—we failed to show our appreciation of what he was, what he did, and *what should be done in furtherance of a wish which so clearly touched his heart?*

"Many things have been done and will be done to keep his memory fresh in the minds of our people. But I think it may be said that, in unique interest, *everything else falls short of the particular scheme which you are trying to help. The George Washington (Memorial) University will serve to crystallize, IN SOMETHING THAT CAN BE SEEN, the character, wisdom, the high principles, and pure motives of the first President, and his important plans for the Nation's future.*

"Most of us have calls near at home to which at times it is not easy to respond. *But I, for one, wish to make an exception in favor of THIS effort, and, as I have said, only wish that I could send a larger contribution. . . .*"

Extracts from editorial in "The Nation" of April 18, 1907:

"Just now a new claimant for intellectual headship among American cities is appearing. *A movement is afoot for CAPITALIZING, under private initiative, the immense apparatus of scholarship at the national Capital. . . . The scientific, historical, and literary treasures of governmental museums and archives are to be rendered accessible as never before to candidates for university degrees.*

"The promoters of the George Washington University movement are much in earnest. They are now closing a campaign for providing a suitable site. *They are seeking no congressional help, but their endeavor is to enlist the sympathies and coöperation of the entire country.* Naturally, prominent men, including the President and the Secretary of the Treasury, have expressed approval of the scheme. Reasons are being advanced by speakers at public meetings why Washington, already a considerable social center, should also become the intellectual capital of the United States. In most lands, it is asserted, the seat of government contains the greatest and in many instances the only great university. . . .

"*Out of the present agitation Washington seems likely to secure a University of distinct importance, devoted in the main to graduate study of a highly specialized character. That in number of students or magnitude of private equipment it will be on a footing with longer established institutions of learning may be doubted. Its opportunity will lie in pushing the development of facilities which cannot be duplicated elsewhere. In certain branches of study it may easily outrank all other American universities: in such subjects, indeed, as Diplomacy, International Law, American History since 1800, Meteor-*

ology, and the application of the Physical Sciences to Agriculture it seemingly must lead all others.

"... The sections from which an important University at Washington will be most likely to draw its students are the West and South. As the result of an increased disposition to seek educational opportunities as far east as the District of Columbia, many a student will find his way for a year or two at Johns Hopkins, Columbia, or Harvard who, but for the attractions of the Capital City, would never have gone beyond the Senior year of the little provincial college in Texas or South Dakota.

"Thus, with scholarly assets already well developed and with comparatively few liabilities, *the other leading American communities can afford to regard with friendly interest and without jealousy the present movement to secure an EDUCATIONAL CAPITALIZATION of the Smithsonian Institution, the National Museum, the Bureau of Standards, the Congressional Library, and all the other working laboratories of the National Government; for the existing federation of intellectual capitals of the continent is certain to persist.*"

THE GEORGE WASHINGTON MEMORIAL ASSOCIATION.

The George Washington Memorial Association, the body of patriotic women organized "to advance and secure the establishment in the City of Washington of an University for the purposes, and with the objects, as substantially set forth in and by the last Will of George Washington, the first President of the United States, and to increase the opportunities for Higher Education of the youth of the United States," and which, in recognition of our change of name, agreed to erect on the new site of the University the George Washington Memorial Building for graduate study and scientific research, held its annual meeting at Rauscher's in Washington City, February 20, 1907. At that time the following officers were elected:

President: Mrs. Herbert Wadsworth, of Washington.

Vice-Presidents: Mrs. Chas. D. Walcott, of Washington; Mrs. Henry R. Mallory, of New York City; Mrs. Chas. J. Bell, Miss Bessie J. Kibbey, Mrs. Fred. B. McGuire, and Miss Alice R. Seward, of Washington.

Trustees: Mrs. Archibald Hopkins and Mrs. Murray Crane, of Washington; Mrs. Leslie C. Wead, of Massachusetts.

Corresponding Secretary: Mrs. Robert S. Chew, of Washington.

Recording Secretary: Mrs. Susanna P. Gage, of New York.

Treasurer: Mrs. Frank Northrop, of New York.

The new president, with her able executive board, has been actively

at work, and plans have been formed for the enlargement of the membership of the organization, and the accumulation of the five hundred thousand dollar fund for the Memorial Building. These efforts have taken form in an address to the members of the George Washington Memorial Association:

ADDRESS.

"As a member of the George Washington Memorial Association you are earnestly appealed to to carry out the object which you helped to inaugurate.

"The dream of a century is about to be realized. It is, in effect, the establishment of what we hope in time will become a national university in the Federal City—a project that was dear to the heart of George Washington, our first President, and for which he thought he had made liberal provision in his Will. You are aware, however, that the fifty shares in the Potomac Company which he bequeathed toward the endowment of a University to be established within the limits of the District of Columbia, and which was appraised after his death at five thousand pounds sterling, or almost thirty thousand dollars, ultimately became unproductive. The ardent wish, therefore, of the Father of His Country, that 'the youth from the different parts of this rising Republic' might assemble at the Seat of Government and learn there, not only arts, sciences, and *belles lettres*, but the principles of Republican Government and the spirit of tolerance, has been unfulfilled, and, until lately, almost forgotten. You are one of those who, as members of the George Washington Memorial Association, have helped to keep alive the memory of Washington's idea, and bring to fruition, after a hundred years' gestation, the enterprise conceived by him. Will you go on with the good work in which many others have now become interested, and give your money and lend your influence to its completion?

"You will remember that this Association in which you hold membership was incorporated in September, 1898, as the result of a meeting of patriotic women held in Washington during the previous December. It was organized for the purpose of increasing in the City of Washington the opportunities for Higher Education, in accordance with the recommendations of George Washington in his various messages to Congress, especially the first, and substantially as set forth in his last Will. The members of the Association soon came to the conclusion that they might most appropriately make a visible manifestation of the desire that was in them by erecting a building which should be the Administration Hall of the University, whenever that should be established. This Hall should contain not only the administrative offices of the University, but also lecture rooms for the post-graduate courses and

a large auditorium for the meetings of scientific and patriotic organizations and of national and international tribunals. This building was to be known as the George Washington Memorial, and affectionately dedicated to the memory of the first President and his interest in Higher Education in America.

"Before any considerable sum had been raised for the erection of this building, a movement for the establishment of a great University at the National Capital began to make itself felt. Revival of interest in this idea was largely the result of a gradual evolution during a period of eighty and odd years of the Columbian College of the District of Columbia into George Washington University. In this development our George Washington Memorial Association played a not unimportant part. The Columbian College, which had been chartered by special Act of Congress, on February 9, 1821, was converted by special Act of Congress, on January 23, 1904, into the Columbian University. By the Acts of April 12, 1892, and of March 1, 1901, Congress had provided that the scientific resources of the Government, the laboratories, the libraries, and the museums of the great bureaus should be available for Higher Education and research, without providing, however, the machinery to make them practically available. In order to aid in securing to students the more extensive use of the exceptional advantages thus provided by Congress, the George Washington Memorial Association entered upon negotiations with the Columbian University. This institution had been one of the first to avail itself of the advantages offered by Congress, and it was furthermore worthy of special note because it possessed an exceptionally excellent charter. In pursuance of these negotiations Columbian University became, by special Act of Congress on September 1, 1904, The George Washington University, and Congress later conferred upon it additional powers of the most comprehensive nature for carrying on Higher Education. Undergraduate instruction is now given through colleges under the jurisdiction of the University, the undergraduate College of Arts and Sciences retaining the name of the original institution, Columbian College. An institution being thus established which might fairly be supposed to approach George Washington's ideal of a national university, the Memorial Association undertook with renewed vigor to realize its most concrete purpose—the erection of a Memorial Building which shall serve the University as an administrative center. It is for this work that your assistance is now needed. The definite plea addressed to you, then, is this: Send in your annual subscription fee of two dollars and persuade your friends to join the Association also. . . .

"Five distinguished firms of architects were invited to prepare plans in competition for our Memorial Building. The plans of Messrs. George A. Post & Sons, of New York City, have been accepted, and

are on exhibition in the Library of Congress. The building is so planned, in its character, proportions, and facilities, as to be worthy of its high object.

"The advantages to the Association of an alliance with The George Washington University are, first, the gift of a site for the Memorial Building, and, second, its maintenance for all time. The total cost of the building, it is estimated, will be about \$500,000, and that is the sum which the members of the Association, including yourself, are expected to raise. Will you do your part?

"A new stimulus has recently been given to the movement for a great University, and consequently to the interest in a Memorial Building to be the heart of that University, by the creation of a Citizens' Committee of the District of Columbia for the purpose of collecting sufficient money to buy a desirable site for the University. The work of raising a fund of \$400,000 for the purchase of such a site was well started in Washington this winter, over \$80,000 having been subscribed in less than an hour at a meeting which was attended by about 100 people. Since then contributions have continued to come in, and there is no doubt but that the citizens of Washington will promptly raise the necessary funds for purchasing a commanding site.

"While the citizens of the District are buying beautiful grounds for the University, and its rich friends are pledging large sums for the erection of noble buildings on that suitable site, wherever it shall be, the George Washington Memorial Association desires to do its part by collecting from the people of the country, in large or small sums, the money needed to erect the Administrative Hall which is to be the particular memorial of the great man whose idea the University embodies.

"It is not desired that this building shall be the gift of a few, but of the patriotic many. It shall be the Valhalla of the Nation, a palace of immortality to enshrine the memories of those great souls who laid the foundation of our country's greatness, or who in future may contribute to that greatness, in which we all, rich and poor, high and low, have an equal heritage."

WHAT THE UNIVERSITY IS DOING.

THE UNIVERSITY.

The session of 1906-07 has been the most prosperous, all things considered, in the history of the University. Although the students' attendance is not so large as that of the previous session, owing to the raising of standards and the increase in tuition fees, the number of regular students devoting their whole time to the work is larger

than ever before in the history of the University. The total enrollment is 1292, representing 48 states and territories, Hawaii, Porto Rico, and the Philippines; of foreign countries, Australia, China, Corea, Costa Rica, England, Finland, Germany, Mexico, Nova Scotia, Peru, Russia, and Uruguay. The student body consists of 76 graduate, 492 undergraduate, and 754 professional students, with 30 duplicates. The members of the faculties and teaching staff now number 208, distributed as follows: 85 professors, 27 assistant professors, 72 instructors, demonstrators, and assistants, 16 lecturers, and 8 librarians and assistants.

During the session the Department of Politics and Diplomacy has undergone a reorganization, and with the beginning of next session is to be known as the College of the Political Sciences. A Division of Education has been formed which is a development out of the 'teachers' Courses which have been so successful for several sessions. The University Library has been enriched through the donation of several thousand volumes in addition to its regular purchases. The classical library of the late Professor Curt Wachsmuth, of the University of Leipsic, has been recently purchased by the University and distributed in the stacks. It contains 7900 volumes and pamphlets bearing on Greek and Roman philology, literature, archeology, and history. The possession of the Heinzel Germanic library, purchased two years ago, and of the Wachsmuth classical library gives our Arts and Sciences library high rank among the university libraries of the country. The work of classifying and cataloguing the contents of the various libraries has been successfully carried on by the librarian and his assistants.

The University Bulletins have been regularly issued under the supervision of the Board of University Publications. The Alumni number which appeared in June, 1906, contained a summary of the work of the session of 1905-06, and an account of the Trustees and Alumni annual dinner. The October scientific number was devoted to the Department of Medicine and contained papers by Drs. Carl Beck, Munroe, Carr, Bovée, Claytor, Grasty, Donnally, Howard, Smith, and Hooe; most of which had been read before the University Medical Society. The December Bulletin was the Faculty of Graduate Studies number and contained important papers in the realm of the physical and natural sciences by Professors Gill, Frisby, Bigelow, James Carroll, Abbot, and Sternberg, and abstracts of theses by Messrs. Whitehead, Ely, and Shear, and Miss Brewer and Miss Ludlow. This number also contained a bibliographical record of the University, as the 1905-06 Supplement to the University Bibliography. The University Catalogue appeared in March, 1907, together with the separate announcements of the Departments of Arts and Sciences, Medicine, Dentistry, and Law. The October issue is to be devoted to the Faculty of Graduate Studies, and the December number to one of the professional departments. The

University publications are sent to 234 American universities and colleges and 90 foreign universities; and the list of exchanges already received embraces 45 American and 20 foreign scientific periodicals in addition to catalogues and circulars.

DEPARTMENT OF ARTS AND SCIENCES.

FACULTY OF GRADUATE STUDIES.

The total number of students registered under the Faculty of Graduate Studies for the year 1906-07 was 77: there being 12 candidates for the M. A. degree, 10 candidates for the M. S. degree, 10 students in attendance, and 45 candidates for the Ph. D. degree. The total number recommended for graduation was 13, of which 5 were for the M. A. degree, 2 for the M. S. degree, and 6 for the Ph. D. degree. Three of these degrees, there being one each in each of the above named categories, were conferred at the Winter Convocation. This is the first time that the Ph. D. degree has been conferred by this University on any other occasion than the Commencement. A Doctorate Disputation was held for the first time in February, and on May 27 Doctorate Disputations were held for the fourteenth time since this institution was established. Five candidates presented themselves and all were recommended for the degree sought. It is gratifying to record that the attendance at these disputations was larger than on any previous occasion, and that others in attendance besides the members of the boards of experts took part in the disputation. We may recall that the disputations as conducted here are unique, and for a time were looked upon as an experiment; but the experts selected have been of such eminence and fitness, they have performed their duties in so serious a manner, and have subjected the candidates to such searching examinations, that we are justified in regarding this departure as warranted. Not the least of the advantages which have resulted is the opportunity which these occasions have afforded for the discussion of the problems of Higher Education with eminent specialists who have been able to observe the results of our work.

As a result of these conferences the Faculty has, during the past year, revised the requirements for the Ph.D. degree, and while still standing for the principle of specialization in research, it has emphasized the requirement that in order to graduate the candidate must possess a broad acquaintance with his major topic. His studies must be pursued under the guidance of a committee consisting of the professors in charge of the University subjects in which the studies are pursued, with the professor in the major subject as chairman, and this committee is expected to apply suitable tests to prove the candidate's qualifications. By action of the Faculty it becomes the duty of the

chairman of this committee to see that the candidate's record is complete and in accordance with the requirements for the degree sought.

During the year Asaph Hall, Jr., Ph.D., has been appointed Professor of Astronomy, and Shepherd Ivory Franz, Ph.D., Professor of Experimental Psychology, thus strengthening these subjects. We now need additional professors in Mathematics, Applied Mathematics, and the Natural Sciences in order to be able to offer a larger range of advanced subjects for qualified students, and furnish subjects properly correlated to those now offered. Attention is called to the advantages which Washington enjoys for the study of Agricultural Science, and it is recommended that this University should especially provide for the graduates of the Agricultural Colleges.

COLUMBIAN COLLEGE.

The registration of students for the year 1906-07 was as follows: Candidates for the B.A. degree, 86; candidates for the B.S. degree, 58; special students, 75; auditor, 1; total, 220.

Twenty-seven college students received degrees during the year, eighteen receiving the degree of Bachelor of Arts and nine the degree of Bachelor of Science.

The change in the plan of the required Freshman English, introducing as a part of that work studies in Logic and Psychology, went into effect this year. Such coöperation as this between English and Philosophy has increased the efficiency of other work during the year. A valuable course in Comparative Biology has been given by the Professors of Botany and Zoology. Courses of Comparative Literature are planned in the subjects of French and English for next year.

Ninety-two women students have been registered this year; one-half of these are in the regular B.A. course. All indications emphasize the stability and seriousness of this class of our students. Their distinctive interests have made the appointment of a Dean of Women so obviously appropriate that it has appeared from the first a part of the natural order of things. During the winter a Young Women's Christian Association has been organized with a membership of forty-five.

The following facts about the educational work are worthy of note. First, the standard of admission adopted years ago has been interpreted with increasing severity and this has tended to give us better students; second, the increase in tuition fees has discouraged the less serious students, affecting chiefly the special student class, and this influence has left the regular students predominant; third, the standard of college work has been very generally raised, both in quantity and quality.

The requirement of two years of college work for admission to professional courses of study gives the professional departments a

direct relation to the College and an immediate concern in it. Columbian College will be an exception to the rule if it does not become the chief source of supply for the professional courses in the University. The College rejoices in the growing consciousness of interdependence in our University life.

WASHINGTON COLLEGE OF ENGINEERING.

The number of enrolled students has been 142, distributed as follows: Civil Engineering, 58; Electrical Engineering, 40; Mechanical Engineering, 18; special, 26.

The class distribution was: Freshmen, 37; Sophomores, 39; Juniors, 34; Seniors, 6; special, 26.

It is very gratifying to note that the attendance is larger than during the session of 1905-06, notwithstanding the rigid enforcement of entrance requirements and the increase in tuition fees. The additions to the teaching staff of two men giving their entire time to the work, and of two others giving part time, made possible the enlargement of the work to a considerable extent. The class-room courses in engineering were supplemented by many hours of required work in the drawing rooms, and all of the laboratory work was more efficiently conducted. In the technical subjects there were given 52 hours of class-room work and 80 hours of drawing, laboratory, shop, or field work each week. This is an increase of 10 hours of class-room work and 51 hours of drawing and laboratory work each week.

For next session additional courses amounting to more than 20 hours must be given. At the same time, we plan to provide more careful supervision of the drawing rooms, and an enlargement of the laboratory work. Three additional instructors have been appointed for the session of 1907-08, one in Civil Engineering, one in Electrical Engineering, and one in Mechanical Engineering. This will give us a force, in the engineering subjects, of seven men devoting their whole time to the College work and one man giving part time. The general subjects of Mathematics, English, Languages, and Sciences, are taken in common with the students of Columbian College, and the Faculty of Engineering therefore may be correctly stated as containing twenty-seven officers of instruction.

The sale of the Van Ness property and the postponement of the selection of a new site has made necessary the rental of temporary quarters. Three connected residences on I Street within four minutes walk of the main building of the University have been leased and will be adapted to our uses. In addition, a building about eighty by twenty feet will be constructed and fitted as a mechanical laboratory. These buildings will give us larger and better quarters than we have had in

the Van Ness House, and will serve us well until a special engineering building is constructed after the selection of a new site.

DIVISION OF ARCHITECTURE.

In this division 37 students were enrolled, and there were 8 regular teachers in the architectural courses opened to them. The work of the students in design has been most satisfactory; great interest has been taken in the *Beaux Arts* problems, and 32 drawings have been sent to the Exhibitions in New York. Twenty-four of these drawings received favorable mention. The library facilities have been much improved through the loan by Professor Remy of his excellent architectural library and collection of photographs. The Students' Architectural Club has had special meetings throughout the year with illustrated lectures by eminent men.

COLLEGE OF THE POLITICAL SCIENCES.

The Department of Politics and Diplomacy, which was founded in 1898 as a graduate branch of work of the University, will in the fall of 1907 become the College of the Political Sciences,—a separate part of the educational system of the University, offering undergraduate and graduate courses.

The undergraduate degree will be that of Bachelor of Arts. The graduate degrees will be Master of Arts and Master of Diplomacy, both of which will require one year of graduate study.

The undergraduate work in the new college will be divided into seven "groups" of studies, each group being designed to prepare the student for a particular career. These groups will be designated as follows: The Diplomatic Group; the Consular Group; the Law and Administration Group; the Journalistic Group; the Business Group; the Sociological Group; and the General Political Science Group.

This enlargement of the work brings with it the necessity for an enlargement of the Faculty. In addition, therefore, to the Faculty of the old Department of Politics and Diplomacy four new men have been appointed for work in the new College. These men are Professor W. W. Willoughby, Ph.D., of Johns Hopkins University, who will give two courses in political science; William Ray Manning, Ph.D., who has taught for two years at the University of Chicago, and for three years at Purdue University, and whose title in the new College will be Assistant Professor of Diplomatic History; Howard Lee McBain, Ph.D., of Columbia University, who will become Instructor in Political Science; and Professor Henry Parker Willis, Ph.D., now of Washington and Lee University, who will become Professor of Finance. It is likely that the teaching force in the new College will be further strengthened through the addition of lecturers in special

subjects, such as Transportation, Political Journalism, and Business Organization.

Under the new organization it may truthfully be said that for the first time it is planned to make systematic educational use of the unique facilities which Washington offers for the study of the political sciences, including economics, history, sociology, international law, diplomacy, and allied subjects

THE DIVISION OF EDUCATION.

In order to meet the local demand for the professional training of teachers, and at the same time to provide instruction in education as a department of science, the University has established the Division of Education, with the expectation that the growth of the work will, in the near future, justify its organization as a Teachers' College. The courses of instruction have been planned to meet the needs of (a) undergraduate students who wish to combine a regular college course with thorough training for the profession of teaching; (b) teachers in actual service who may desire to add to their professional qualifications by taking further special training; (c) graduate students who wish to fit themselves for the more responsible positions in teaching or in school administration. For the first, a four years' course has been established, denominated the Teachers' Course. It may be taken in conjunction with either the Bachelor of Arts or Bachelor of Science course. For the second, provision has been made, first, by offering the greater number of the professional courses in the late afternoon, and on Saturday, so that they may be taken by teachers or by persons occupied in Government departments; second, by offering to teachers in actual service Scholarships of a value of one-third the regular fees, on conditions named in the "Special Announcement" of the Division. For graduate students, the exceptional facilities existing in the extensive collections of the Library of Congress and the library and archives of the U. S. Bureau of Education, afford unrivalled opportunities for historical research; while the school system of a large city, and the laboratories of the University, present ample opportunity for observation and experiment. In recognition of the professional training received, students who graduate in the Teachers' Course will be granted, in addition to the Bachelor's degree, a Teacher's Diploma. As a teaching staff, to give instruction in the professional branches, the Trustees have appointed the following: Williston S. Hough, Ph.D., Professor of Philosophy in Charge of the Division of Education; William Carl Ruediger, Ph.D., Assistant Professor of Educational Psychology; Elmer Ellsworth Brown, Ph.D., U. S. Commissioner of Education, Lecturer on Education; William Estabrook Chancellor, A.M., Superintendent of Public Instruction, District of

Columbia, Lecturer; George E. Myers, Ph.D., Principal McKinley, Manual Training School, Lecturer; Willard S. Small, Ph.D., Principal Eastern High School, Lecturer; William W. Black, A.M., Supervising Principal, Lecturer; Stephen E. Kramer, B.S., Supervising Principal, Lecturer. Courses are offered in the principal branches of educational theory and practice as follows: History of Education, 2 courses; Educational Psychology, 5 courses; Principles of Education, 5 courses; General and Special Method, 7 courses; Administration and Supervision, 5 courses; Practice Teaching, 2 courses. A Teachers' Appointment Bureau has been established for the purpose of aiding students in securing desirable positions as teachers.

FACULTY OF MEDICINE.

DEPARTMENT OF MEDICINE.

The total registration was 226, the students being distributed as follows: First year, 48; second year, 46; third year, 46; fourth year, 75; special and review students, 11. The degree of M.D. was conferred upon 63 members of the Senior class. There have been more students devoting their whole time to the work, and fewer falling out during the year, than ever before. So that although the attendance is somewhat smaller than that of last year, the student body is composed of more stable material. By special direction of the Board of Trustees upon recommendation of the Faculty, three women have been matriculated for the degree of M.D. The Medical Library has been increased by 200 volumes through purchase and gift. The only important change in methods of instruction has been the systematic use of the case history method, and the results are most gratifying. Following the general policy of the University to require as thorough work of the part-time student as of the full time student, the schedule of the Freshman class has been so arranged that next year it will not be possible for the part-time student to take all of the work outlined for the full time student. The result will be that the part-time student will have to spend five years instead of four in obtaining the degree. From the number of inquiries received there will doubtless be a larger number of new students entering next session than heretofore.

DEPARTMENT OF DENTISTRY.

There were 10 students in the first year class, 22 in the second, and 18 in the third; a total of 50. All of these were pursuing the regular course. Fifteen members of the Senior class received the degree of D.D.S. on Commencement Day. Educationally the session was highly successful and the lectures and laboratories were well attended. The entire graduating class of last session were successful in passing the

examination of the District of Columbia Board of Dental Examiners, and the report of this Board to the National Association of Dental Examiners was evidently flattering to the methods of instruction in this department. In the Dental Infirmary, under the direction of an assistant professor and corps of assistants, the instruction has proceeded with better results than ever before. The patients numbered more than 5000.

NATIONAL COLLEGE OF PHARMACY.

The number of students enrolled in the several classes was as follows: Freshmen, 35; Juniors, 16; Seniors, 10; special, 3; total, 73. Standards of admission to the College have been raised, and by degrees the College will fully conform with the educational requirements of the University for other departments. Two new professors have been added to the Faculty for the coming session.

DEPARTMENT OF LAW.

The work of the session just passed has been distinctly successful and marks a long step forward in working out the general plan to raise the department from the position of a mere local law school to that of a law school which may reasonably entertain hopes of becoming the representative American Law School. The total attendance in this department during the passing session was 366, distributed as follows: First year, 70; second year, 107; third year, 97; fourth year, 16; special, 17; patent, 23; review, 26; Doctor of Jurisprudence, 1. The decrease in the size of the first year class has been due to the putting of the work of the Law Department on practically a full-day basis, making it impossible for students in the Government employ to complete the course in less than four years, to the increase in tuition fees, to the marked raising of the standard of work required, and to the practical elimination of the old lecture method of teaching and the substitution therefor of the case system, which necessitates a much greater expenditure of time on the part of students and renders mere attendance without preparation comparatively useless. Hence this decrease in the number of students is doubtless temporary and the changes which have been made will inevitably elevate the character of the work done and enhance the reputation of the department locally and abroad. There are already many indications that the reputation of this department is rapidly extending throughout the country, and there is among the students an enthusiastic appreciation of the higher ideals towards which the school is striving. The Faculty consists of 17 members, of whom four are giving their entire time and attention to the University. The library has been increased by nearly 500 accessions through gift and purchase.

UNIVERSITY CONVOCATIONS.

The first Fall Convocation of the University was held in Memorial Continental Hall, October 17, 1906, at 5 o'clock p. m. The address was made by Professor Carl Beck, M.D., of New York City, on the "Influence of American Medicine and Surgery on Europe." This address appeared in the October Bulletin. Degrees were conferred upon eight candidates as follows: D.Pharm., 2; LL.B., 4; LL.M., 1. The music was furnished by the University Orchestra.

The third Winter Convocation was held in the Belasco Theatre on Friday morning, February 22, at 10:30 o'clock. The address was made by Rev. Richard D. Harlan, D.D., LL.D., Past President of Lake Forest College, on "Municipal Patriotism." Degrees were conferred upon 9 candidates as follows: A.B., 1; M.D., 1; D.Pharm., 5; LL.B., 1; M.Dip., 1; M.A., 1; M.S., 1; Ph.D., 1. The honorary degree of LL.D. was conferred on Mr. Oscar T. Crosby, of Washington City. The music was furnished by the Marine Band.

THE EIGHTY-SIXTH ANNUAL COMMENCEMENT.

On Sunday afternoon, June 2, the Baccalaureate services of the University were held in Memorial Continental Hall. The sermon to the graduating classes was preached by Rev. Dr. Richard D. Harlan from the text "I am the way, the truth, and the life."

The University Commencement occurred in the same place on the following Wednesday, June 5, at 10:30 o'clock. The University procession was formed at University Hall, and marched through Lafayette Park down 17th Street to the Memorial Continental Hall. The invocation was pronounced by Rev. Frederick D. Power, D.D., LL.D., pastor of Mount Vernon Christian Church, Washington, D. C. The Commencement address was delivered by Professor S. C. Mitchell, Ph.D., D.D., of Richmond College. The candidates for degrees were presented by the Deans of the respective Faculties to the President, who granted them their diplomas. There were in all 220 graduates, distributed as follows: B.A., 17; B.S., 7; B.S. in Chem., 2; B.S. in C. E., 4; M.D., 61; D.D.S., 15; D.Pharm., 15; LL.B., 63; LL.M., 9; M.P.L., 17; M.A., 4; M. S., 1; Ph.D., 5. No honorary degrees were conferred.

Scholarships and prizes were announced by the Deans. Meetings of the Trustees of the University, Columbian College, and the Washington College of Engineering were held in the afternoon.

On Wednesday evening a reception at Rauscher's was given by the President and the Trustees to the members and friends of the graduating classes.

THE ALUMNI.

At the Fall Convocation, October 17, 1906, 7 degrees were conferred; at the Winter Convocation, February 22, 1907, 13 degrees were con-

ferred; and at the Commencement, June 5, 1907, 218 degrees were conferred. Since its organization in 1821, the University has conferred 6850 degrees on 5438 persons.

The Secretary of the General Alumni Association, whose office is at the University, endeavors to keep a list of the addresses of all Alumni. His catalogue now contains the addresses of 3659 graduates. It is known that about 1100 are dead, and information is lacking in regard to the others. All Alumni are urged to keep him informed of any change of address or occupation, and to supply information in regard to their fellow Alumni.

During the year the General Alumni Association held its annual business meeting and reception at the University and on April 23 held its annual banquet at Rauscher's, which was attended by more than 100 Alumni. Mr. E. C. Brandenburg, President of the Association, was toast-master. Speeches were made by President Needham, Mr. Justice Anderson, Rabbi Simon, Drs. White and Carr, and Messrs. Mason, Richardson, and others. Several of the branch Alumni Associations in other cities also had annual banquets.

In furtherance of the efforts to raise a fund for a new site and for endowment, the General Alumni Association appointed an Alumni Committee to coöperate with the University Committee. Substantial contributions have been made by Alumni to this fund and it is expected that the total will be largely increased during the coming year.

STUDENT LIFE.

Foot Ball.—The season was begun with nearly all of last year's team on the field and a large increase of new material to draw from. The management was in the hands of Mr. E. C. Wilson, Medical '07, and Mr. E. M. Ball, College '08, Assistant. The efficient services of Mr. Wilmer G. Crowell, as Coach, gave the team a knowledge of the game that they have never before shown. Mr. Crowell was Swarthmore's captain the year before when that team made the most brilliant record in the history of that institution. He was a most capable coach, and, barring one or two mistakes, was the best instructor in the game that has ever been on the field, and should have made an enviable record with the team.

Mr. B. G. Steenerson, Law '07, was again Captain of the team, and in every game showed that he was as good an individual player as has ever worn the buff and blue. The schedule included eight strong games with heavier teams than the University has ever before attempted, some of which there was no reason to believe that George Washington could defeat, but the record was only three defeats, namely, Lehigh 6 to 0, Swarthmore 17 to 0, and Georgetown 16 to 6. The event of the season was the game with the University of Virginia, in

which the wearers of the buff and blue played Virginia one of the strongest games of the year, the result being 0 to 0, the visitors being lucky to get off at that, for the local team clearly outplayed them. The Georgetown game was a great disappointment. The playing of our team had been such that there was every reason to believe that it would bring back a victory from Georgetown. The team did play a great game, but was demoralized by the sudden inefficiency displayed by a player in a most responsible position, on account of which Georgetown scored twice when it seemed easy to prevent it. Gallaudet was defeated 27 to 0; Randolph-Macon, 22 to 0; Western Maryland, 8 to 5; while the games with Baltimore Medical and Virginia were scoreless ties.

Financially the season was better than any preceding. All debts were paid and a surplus left in the treasury. The games were arranged with a view to saving expense in travel and bringing larger crowds to the home grounds. For next year Mr. Ball, last year's Assistant Manager, has been elected Manager, and has already almost completed next year's schedule, which includes as strong a list of teams as that of the past season. Mr. J. M. Gunning, College '08, has been elected to captain the team.

Base Ball.—The team met the most representative teams in the country, such as Yale, Columbia, Cornell, Syracuse, North Carolina, Virginia, and others. While the season cannot be called a success from the standpoint of victories, yet there was a marked step forward over the schedules of former seasons, a much higher grade of teams being met, and the sphere of action being materially widened. The management was ably conducted by Mr. H. Clay Willis, Medical '09, who took the team on a week's trip through North Carolina and Virginia. The Captain, Mr. S. H. Titus, was assisted in getting the team into shape by Mr. "Cy" Cummins, who proved a valuable coach. The sport was not as loyally supported by the student body as it should have been and some of the games were a financial loss, but the season as a whole was about as the preceding year. The two games with Georgetown were the closest and most interesting ever played between the two institutions, and their outcome was in doubt in each instance till the last inning. The first was lost by a score of 6 to 7, and the other by 1 to 3.

Track. Although track work is very young at the University, yet the team this year made a remarkable record. It participated in meets of Washington, Baltimore, Norfolk, and Charlottesville, and won one or more first places in each. A team of nine men entered in the Charlottesville meet, and won second place in points, being a close competitor to the University of Virginia, which had a team of thirty-four men.

Lorando won first in the mile, the half, and the quarter, while Sterrett won the pole vault, and Gill the two mile. The inter-class meet was again held on the Van Ness track, and although the severe weather interfered with the runners, excellent records were made.

Basket Ball.—This game was played here for the first time this year, yet a winning team was put out. Interest was aroused at once, and the game will become a permanent feature of the University athletics. Two games were played with Georgetown and both were won by our plucky team. The University of Virginia was also defeated. A trip was taken into Virginia, including games with Washington and Lee, and other teams. Mr. W. P. Wood was largely instrumental in arranging the schedule and getting up the team. Mr. M. S. Biddle has been elected to succeed him next year.

Rifle Club.—The Rifle Club team won a notable victory at the National Shoot, at Seagirt, winning the beautiful trophy which was given to the winner of the Intercollegiate Match, and which was won by Princeton last year. A number of Eastern colleges participated, but George Washington was easily the best. A team will be sent to the meet again this summer. Mr. Jackson Morris has been very zealous in equipping and training the team, and to him is due the credit for the prominence given the University at Seagirt by its victory over the Eastern universities.

Debating.—The debating record of the University this year has been but a continuation of the most remarkable record in debating that any university can claim. The seventh consecutive victory was registered when the University of Syracuse was defeated during Commencement week. The six preceding, won during the last three years, were with the University of Virginia, Washington and Lee, two with the University of Cincinnati, Georgetown, and North Carolina. On March 1 of this year the University of Cincinnati was defeated in Cincinnati by a team consisting of Messrs. Agnew, Gates, and Allen; on April 12 the University of North Carolina was defeated by Messrs. Couden and Hindman; and on June 4 Syracuse went down before Messrs. Gates, Kennedy, and Baer. It is noticeable that the University has not lost a debate since Professor Veditz assumed charge of the debating interests here. To his skill in training the debaters is due much of the unrivaled success of the University. There have been five public debates between the societies of the University, the Columbian winning two from the Needham and the latter winning one from the Columbian and one from the Enosinian. During Commencement week the final debate was held between the honor men of the preceding four debates.

Publications.—During the past year the student publication, *The University Hatchet*, has been placed under the control of a Board con-

sisting of two members of the Faculty and five students, which elects the Editor and the Manager in May of each year, and has entire charge of all affairs of the paper. Steps are now being taken to complete the incorporation of the Board. Its members are Professors Carroll and Vance, of the Faculty, and Messrs. R. I. Moore, A. J. Russell, E. P. Gates, L. H. Call, and E. C. Wilson. During this year the Editor-in-Chief was Mr. R. I. Moore, and the Manager, Mr. A. J. Russell. The Board has elected Mr. E. P. Gates and Mr. F. C. Allis, Editor and Manager, respectively, for next year.

The Mall of 1906-07, which appeared in May, continues to uphold the high standard of former editions. Mr. K. M. Block was Editor, and Mr. J. R. Biggs, Manager of this volume. The Association of Class Presidents has elected Messrs. L. H. Call and E. D. Everett, Editor and Manager of next year's book.

Y. M. C. A.—The Young Men's Christian Association has become firmly established in the University, chiefly through the untiring efforts of Mr. Ernest Eaton, aided by the support of Dean Wilbur. Last fall a notable gathering assembled at a dinner in the city Y. M. C. A. building, and listened to stirring talks by the world-renowned speaker, Fred B. Smith, and others almost as widely known. The Association had the honor of entertaining in its halls in April the largest gathering of Y. M. C. A. men and students ever assembled in this city. More than six hundred from all parts of the city came together to hear and meet Fred B. Smith, who has taken a deep interest in the Y. M. C. A. of the University.

The reader may feel inclined to contribute to the realization of the objects of the George Washington University Movement. If so, will he kindly fill out and tear off the form given below and mail it to the Chairman Committee on Buildings and Endowment, The George Washington University, Washington, D. C. If he wishes his subscription to go to some particular object, or desires further information, or would like to confer with a representative of the University, the Chairman will be glad to enter into communication with him.

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To secure the sum of four hundred thousand dollars to be applied by the trustees toward the purchase of grounds and buildings, and the enlargement of the educational work, and in consideration of the subscriptions of others, I will pay to **The George Washington University**

..... DOLLARS

in five equal installments, the first installment to be paid on the first day of July, 1907, the remaining installments payable respectively on the first day of July of each succeeding year until all installments are paid.

Or will pay
in full on..... Address

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NO. 3

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The present scientific number is devoted to the Faculty of Graduate Studies and especially to the departments of arts and literature. A number of papers from members of the faculty and abstracts of theses accepted for higher degrees are presented. It contains also notes bearing on investigations and researches made by instructors; announcements of recent appointments, and miscellaneous items of University interest. The Board desires to be kept informed as to the academic record, publications and professional appointments of instructors and graduates in all departments of the University. Communications may be addressed to the Chairman.

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The George Washington University BULLETIN

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OCTOBER, 1907.

No. 3.

"PHILEGM VERSUS FRENZY IN SOME CURRENT DISCUSSIONS."¹

By E. BENJAMIN ANDREWS, D.D., LL.D.,
Chancellor of the University of Nebraska.

With all its good, which far outweighs its ill, the free press that we in the United States enjoy often works great harm. Non-occurrences are reported as facts; facts are misreported in every possible way. Statements are garbled. The fables pass from reporters to editors.

Newspapers and magazines rarely eat their words, so that these "fake" reports and editorials are far and wide accepted as if they had solid basis. Such fabrications not seldom damage reputation or even, in the eyes of many, ruin it; but, if they do not provably involve libel, the injured parties have no redress.

If one suffering so cares to deny the false allegation, the paper first guilty may possibly publish what he says; but, as others will not, the lie travels on and on. Should he fail to protest, the utterance is set down as true and just. Silence is viewed as a plea of "guilty." The man is outlawed. Paragraphists guy or butcher him as they list, till readers weary. If he has reputation, or if the doings or sayings ascribed to him are "hot stuff," as the reporters phrase it, the *canard* goes the round of the press, and then out and back and out and back again, like an echo, save that the reverberations add to the original bruit instead of dying away.

When the statement is clearly libelous if true, yet the libelee does not prosecute, then, nearly all agree, he must be guilty. Doubt is no longer possible. But doubt is quite possible. The libeler may be so worthless that beating him would mean nothing but an empty judgment. And if you collected damages, what requal are a few hundreds or thousands of dollars, not enough to pay your attorneys, when lies about you have been reiterated in the press till half your countrymen think you a monster! A proved libeler in a case of that kind deserves to be hung.

¹ Extracts from address delivered at the Fall Convocation of The George Washington University, in Belasco Theater, Wednesday morning, October 16, 1907.

It is the crowning baseness of our time—which is saying a good deal—this selecting for victim some character so distinguished as to assure piquancy and a market for your inventions, and then, craftily avoiding suable libel and relying for fuller protection on the victim's known kindness, industry and dignity, proceeding to vivisection him for pay. None of the business villainies alleged to be so rife could compare in atrocity with these squalid campaigns of libel and libelous caricature which recent months have produced.

Although blackwash is rather more offensive than whitewash per square inch, still, if the blackwash could be confined to the faces first touched, protest would be less in place. But blackwash spreads much worse than whitewash. All know, and the detractors themselves admit, that those they arraign are in principle no worse than others; that the deeds and methods denounced prevail throughout the business world. At times, the critics themselves lay the whole fault impersonally to "the system," yet they are inconsistent enough to keep on berating individuals. If their complaint stands the entire business public is smirched.

I join any man and praise all zeal in ferreting and rooting out real wrongs. What I plead for is discrimination. An old scripture says: "Woe unto him that calleth evil good, or good evil." Blackwashing is as wicked as whitewashing. Hew to the line, by all means, but not through it. Let no guilty man escape; let no innocent man be put in prison or under ban.

A stand against the indiscriminateness of much current criticism seems to me a public duty. Justice and fair play demand it. The hue and cry endangers vitally needed legislation. Evils do exist, some of them portentous.

Criminal misuse, for personal gain, of both public and private trusts has been found to be too common. Dishonest promoting is not rare. Gambling speculation is rife. Taxation is grievously unjust. Legislation is bought and sold. Our laws favor too much the idle wealthy. These and such are society's desperate ills. If we are not rid of them the state cannot remain free. Incomparably the saddest aspect of our case is that these abuses have grown up in the midst of democratic communities. If the people cannot learn to administer better they will sometime in their disgust renounce the task.

Congress and legislatures are astir. New attempts will occur early in every law-making body throughout the Union to promote fair dealing and to repress fraud and graft. But there is perilous possibility that the efforts will vanish in smoke because of so much unreason in the call for them. Bills will be killed in conference or else enacted but found inefficient or positively baneful. Your honorable committee sets out to draft a reform measure and gives hearings. Exaggeration, misjudgment, anathema, wind have the floor at every session. Members

conclude that as most of the allegations are false, extravagant, or vague, the real ills must be few and inevitable. Whereupon your committee either reports no bill at all, or, if owing to the clamor it is felt that something must be done, a bill reading fairly but calculated to breed infinite litigation without the slightest advantage to any. If I were a wicked Croesus, bent upon lucre at any cost, as our very wealthy are by many supposed to be, and were scheming for continued immunity in grinding the poor, I would pay agitators royally to keep on charging against capitalists all the woes men suffer. Such moneys would be the best investments I could make. In no other form is wealth now doing so much to perpetuate the abuses of wealth as in publishing the Hearst newspapers.

No one pretends that business morality in the United States is spotless. It has most regrettable shortcomings. Leaving out of the discussion ordinary human frailty, which is of course presupposed, and the cases of clear criminality which all alike wish punished, the faults proceed from two sources. One of these is the filthy lucre mania now gaining fresh strength. Friedrich Nietzsche with his anti-gospel, that might is right and unselfishness the religion of slaves, has won more of a following in twenty-five years than Christ secured in five centuries. The sense of honor has fallen, not alone in commercial walks but among all classes. Clergymen, professors, orators, senators, and business men generally, no less than Wall street operators prize material welfare too much relatively to the things of the spirit. All admit and deplore this; and it is to be hoped that even the ugly diatribes I am noticing may, in spite of their bad temper and exaggerations, help pump oxygen into the moral air.

But most torts in contemporary business have source outside of men's cupidity. I ask special consideration to this.

Thousands nurse the hallucination that morality is not only an exact but an *a priori* science. The common view seems to be that men's intuition, or the Bible, or some other accessible repository, contains a detailed register, a sort of moral nautical almanac, where any man can, by consulting the index and then turning over a leaf or two to find the proper line and column, obtain an absolute answer to every moral problem that can be raised. It is supposed that no one need ever do an anti-social thing, and that none ever so transgress save with evil purpose. Why should you go queer in business when an exhaustive moral code, covering all business as well as all other relations and conduct, always awaits your consultation? If you do wrong your heart must be corrupt.

In fact the case is far less simple. In the business perplexities of our day one cannot by just pushing a button have the right answer brought in on a tray by a servant. Concrete morality is no rule of

thumb affair. Like law and medicine it is an inductive product, its solutions requiring not only deep and patient study but, often, long experience individual and social. Our traditional code itself is the result of such experience, a thousand generations in the elaboration.

Nor is right action in our complex business matters a mere function of a good heart. An instructed mind is essential. We must trade to-day and to-morrow, traffic and bank, build, ship, hire and let as decently as we may, but whether or not our procedure in all this exactly tallies with the greatest good of the greatest number none can certainly know till we have observed decades longer. All present judgments in the premises must be tentative, and, if you curse your neighbor for doing thus or so, your reproof is as likely to be wrong as his act.

I speak, in the main, of problems presumed to be ultimately soluble in the sense that they can by and by be referred to determinate rules.

Another class of questions arises which can never become determinable in that sense; never be referred to any principle, because no principles for them can ever be worked out; questions, therefore, which must forever be answered by the higgling of the interested each at the time it arises.

Suppose Elihu Root declined to be Secretary of State for \$8000 a year but consented if we would pay him the worth of his services. What should the figure be? The sum he could earn practicing law, said to average \$1000 a day or \$313,000 a year? Or should he rebate something for the honor? If so, how much?

The prices of monopolized articles, on the theory that competition ought to fix prices, since competition no longer exists in these articles and no one can say what prices it would fix if it did exist, are subject to no principle whatever save the tolerance of the market.

And in many lines of business where wages or prices are determined by some rule, as supply and demand under competition or the tolerance of the market under monopoly, the rule has no rigidity, but illustrates, rather, what Walt Whitman calls "the eternal float of solution."

Into this vast murk of enigmas gaily trip our new moral instructors with their cockshure solutions but no other credentials, ignorant of serious ethics and of economics, weak on logic and often confessedly prejudiced, yet launching anathemas right and left as no infallible Pope ever did. This man sold so; that one shipped so; the other kept books so; rogues all; grill them; away with such fellows from the earth! We create over night categories of sins and next day use them to consign men to perdition as coolly as if we were applying the decalogue itself.

We incessantly confuse impropriety, impolicy and unwisdom with fraud and crime. Instance any of the famous investigations which

have been or are on foot. Comparatively little that managements are blamed for has been criminal or even illegal, though overmuch has been impolitic and of evil tendency and deserved rebuke and correction. Most of what is illegal is so simply by yesterday's statute.

Another gross error is that of blaming persons, when fault, if any, attaches to human nature or to society.

When you call it "unjust" that one man should own \$1,000,000 instead of 1000 owning \$1000 each, what you mean is, no doubt, that you regard it a pity the world is so put together as to permit such inequality. You are wild to lay the fault to a man or body of men, or to legislatures, courts or Congress.

The new preachers continually play upon and intensify the prejudices of those with whom it hopelessly damns a man that he is wealthy. The poor, the vast majority of us, naturally hate the rich. Among the have-nots a fellow who begins to accumulate gets with his dollars the cold shoulder from his mates. The better-off he becomes the greater his isolation. Moderate possessors ostracise similarly any of their number amassing thousands: the holders of thousands, the winners of hundreds of thousands. Spite of all this a voice will now and then be detected calling you a worthy citizen till you turn millionaire. Then you are a reprobate. It would seem to be the practically unanimous view among plain people that no man alive can own a million dollars and be honest. Ten or a hundred million stamp their owner as a criminal with nearly all.

I hold no brief for any among the rich. I care not a straw for the rich as such. My interest and sympathy is solely with general society and the common man. And, speaking as a representative of the public at large I urge that the pride, idleness and doubtful practices of a few rich are no just cause for putting all rich men in pillory. The possession of wealth, however great, furnishes by itself no presumption against the owner's perfect probity.

If a man can fraudlessly become possessor of ten thousand, he can, if he works on with the same zeal, skill and power, not only as easily but more easily, secure a hundred thousand, two hundred thousand, five hundred thousand, a million, a hundred million.

Just here financial geniuses find opportunity. Now and again rises up amid the common throng of business men one with the ability to utilize to the end that semi-automatic power, to set and keep his hundredth million earning with the same precision governing his first investments. In ever new directions he continues foreseeing what the public or mankind will want and equips himself to cater and reap accordingly. He hunts out new markets and scrutinizes old, buying in the cheapest and selling in the dearest. He reforms modes of production, of distribution, of exchange and of transportation in his trade.

He scents the commercial meaning of scientific discoveries. He finds out what is going on in far lands. A world's openings for wealth-getting reveal themselves to him, which he enters, partly because no one else knows of them, partly because he is surer than others touching their value, and partly because of his greater resources. He combines industry with industry and effects saving. He takes advantage of rivals' errors and hesitancy. He can select and manage men. Titanic endurance enables him to keep a thousand irons in the fire at once. So long as such gifts remain in exercise the man goes on creating wealth at an ever accelerated pace. If he becomes a billionaire you have no right to denounce any part of his fortune save upon proof of fraud. The mere fact of his being so rich is naught but a proof of his genius and his industry.

Should a billionaire arise it would be no mystery; the mystery is that billionaires are not already present in some number. The explanation, aside from the rarity of genius, is to be found in this, that after a man has won some millions the initial spur to wanting, the desire personally to have, use and enjoy large wealth, ceases to prick. A man with two million can never in his life be practically any richer. He has all that he can personally use, even for display.

If such a man nevertheless keeps on acquiring it must be for the name of possessing extreme wealth, a rarer motive, I believe, than most of us suppose, or out of habit, to vent a native or acquired need of activity; or, that he may do mankind good. For, be it remembered, the creation of new wealth in the world is always a high form of beneficence. I am of the opinion that a considerable number of our very rich men make money not to multiply their delights or to procure renown, but to advance human happiness. When such a man continues working after others retire, it betrays not greed but philanthropy.

The multimillionaire certainly, like dynamite, will bear labeling and watching. The energy stored in him is vast and may explode to lay things waste. But are you going to order out of the country all men and substances deemed dangerous? No Dewey more? No giant powder? Part with Roosevelt, Niagara, electricity? The destructive ability of these agents, if they go off at the wrong moment or in a wrong way, is absolutely frightful. The most dangerous object any nation can own is a general like Napoleon. What would not Russia give for so valuable a peril now? A nation's deadliest peril may lie precisely in her freedom from a given peril.

I cannot take so seriously as the excellent Judge Grosseup seems to the gathering of wealth-titles into fewer hands, which, to my thought, means, in the main, simply a more efficient administration of the country's productive machinery; nor do I anticipate any plethora of the very wealthy.

Not only can we stand multimillionaires but our growth in civilization, as things are, demands them. When you have perfected that scheme of yours and reconstituted society, we may get on without them; now they are a necessity. So long as the initial craving for wealth, the love of it for personal uses, is strong upon men, they are not generous. Suppose the total wealth of the United States as great as now but no multimillionaires owning any of it, only millionaires, the lesser rich and the greater poor, is it for a moment supposable that art, education, religion, hospitals, reform and relief work at large, and scientific research would be provided for either so wisely or so munificently as now?

There are to-day millions of American dollars whose interest is used for extremely recondite but most desirable investigation touching the history of our country; other millions supporting medical research calculated to lessen pain and disease and prolong life; and other millions still assisting poor farmers to till their soil productively; which millions, even if they existed, would, to a practical certainty, not be performing such invaluable services had not a few benevolent men become extremely rich. Congress would never have voted money for these ends, nor would people of moderate means ever have contributed.

Another office which, at present, only the multimillionaire can fill is that of the adventurous investor. We vitally need such investors, we always shall need them, and the need must become more and more imperative. In one voice we are calling upon directors to stop making hazardous investments of trust funds, and upon all multimillionaires to abdicate. **The cries are incompatible.**

I call attention to the fact that nearly all the real evils now popularly denounced proceed from corporations. Managers are in effect forced to be hard. To keep their positions they must make dividends. Dreadful pressure is upon them to effect sales, and to reduce expenses in every way possible. Adulterations, dangers to work people, child labor, unjust cuts in wages, fraudulent promotion and capitalization originate in the awful urge that is upon managers to grind out profits by hook or by crook.

The joint stock method of business is no doubt to a great extent a necessity and a fixture. Massive industry to-day calls for the corporation and will long and perhaps always continue to do so. But its evil might be diminished by the multiplication of men rich enough to own great businesses and talented enough to be their own managers, dealing directly with their help and with the public.

As I predicted in '89, nearly all the staple commodities dealt in by the American people have become subject to monopoly. They are no longer produced or sold competitively, as earlier. This installation of monopoly has brought or helped bring a rise in nearly all prices. The

advances since 1880 are not due to this cause alone, but most of them are partly due to this cause. Whereas, before, consumers were, because of competition among producers and sellers, able to purchase goods, as a rule, at an inconsiderable advance on cost, now, a broader law regulates most prices, that of the tolerance of the market, the price of any commodity tending to go up to the point affording the maximum from sales, to such a point, in other words, that, were it to rise higher still, the falling off in sales would cancel the gain from the increased price.

Now this reign of monopoly was not ushered in by any one man or set of men, or through legislation or in malice. It was an inevitable evolution, not less natural than the preceding *regime* of competition but, of the two, rather more natural than that. It may easily work net good, increasing wealth, which is always a gain for all and not merely for those first benefited. Ranges of business ability and of morality itself may be called out by it higher than the old order could have produced.

When a form of industry stands years long, in face of every vicissitude, outliving all sorts of crises, antagonism the most bitter and competition the most intense, whatever it may owe to individual volition and agency, real and sad as certain hardships it entails may seem or be, even if it has to be ripped up for the sake of some better form, it cannot be called arbitrary. It is an economic creation, falling in with the material, political, social and personal factors which exist and co-operate at the time.

All deem wages just however high. Nearly all the price-advances which monopoly has produced are acquiesced in by the public. Complaint continues only in respect to a few articles, but it can easily be shown that the more or less recently advanced cost in these cases is due to precisely the same causes affecting the cost of our living at every point. It is more and more seen that no soundness attaches to competitive prices. Price-fixing by competition is not a fundamental operation, parallel with price-fixing by market-tolerance. It is only a special case of market-tolerance, this latter being the general phenomenon and competition a special form of it.

Are consumers, then, in respect to prices, at the mercy of dealers? Can they charge us whatever they please and must we pay or go without? Not at all. Relentless as is the law that while monopoly lasts the price will stay near the tolerance of the market, dealers charging you all the traffic will bear, equally inexorable is the law that no price can stay above this limit. Suppose silk hats, under competition, sell at \$6. Combination may force them to \$6.50 or \$7; but no power on earth could drive them to \$10. Let sellers find that a price is so high as to block net profits, you need no legislation or consumers' league to make them come down.

Wealth got by advance of prices, though it may make consumers poorer in the first instance, and a given individual *permanently*, can't otherwise than momentarily impoverish the general public: for the most of it is at once invested and at once begins to support industry again.

Of course, those newly (or more) enriched will spend *part* of the gain in personal ways, non-productive, but it could probably be established:

1. That the proportion of non-productive expenditure to the total of any society's wealth is less and less as the proportion of wealthy people increases. It is greatest among poorer people.

2. That it decreases in proportion as the wealth of the wealthy passes into fewer hands, i. e., as the wealthy become *very* wealthy.

Suppose Mr. Pierpont Morgan worth \$500,000,000. His non-productive expenditure is not greater than that of most millionaires. Then suppose his wealth distributed to 500, the idle expenditure would be multiplied by 500. If it is \$1000 a year in his case it would be half a million by the distribution.

The folly of popular judgments in these matters appears clearly in the fact that the rich who are railed at are in all cases the productive and useful rich, demonstrably benefactors of mankind on a colossal scale, and never the idle rich, who, however legally, and to a certain extent, perhaps, properly, live at the public expense.

People of great wealth form three classes. One consists of those who create their wealth. These, with all their faults, are desirable citizens, a blessing to the nation, not mainly for what they give away but far more because of the resources they provide, in the way of new wealth, for the honest self-maintenance of many engaging in business on their own account or earning salaries or wages. This extension of opportunity always attends the origination of wealth.

A second class of the wealthy embraces those who earn or create nothing in any usual sense of the words and are therefore in the main dependents, yet not quite wholly so, because of the good judgment they display in the choice of their business agents and investors. This last is an advantage to the world so far as it goes, because all of us are interested in having wealth, by whomever owned, wisely instead of wastefully employed.

A third class of wealthy persons have not even this claim to public esteem, as they earn or create absolutely nothing, even the agents handling their wealth being selected by others. These wealthy are utterly non-productive. So far as their wealth is concerned, they perform no social service whatever. Economically the public would be better off if they were dead. Socially they are hangers-on pure and simple and producers or helpers in no sense or degree whatever.

This does not necessarily mean that the non-producing rich should be arbitrarily suppressed. They are somebody's children or friends; and a law to exterminate such and prevent their existence would probably repress to some extent men's zeal in begetting wealth, which would be a great misfortune. Probably a heavy death and inheritance tax is as far as the state could safely go at present in keeping down these undesirable citizens.

It may be urged that wealthy persons of my second and third classes are often benevolent, but this is no argument in their favor from a social point of view unless there is reason to suppose that men and women not earning their wealth are more benevolent than those who earn. I know of no evidence to that effect. The fact is probably just the reverse.

Is it not clear that if we must inveigh against any of the rich, we ought to select the third, utterly unproductive set, or the second set, mainly unproductive, instead of those who not only pay their way but help the rest of us pay ours? The productive rich may do wrong in various ways, and if they do it is a pity, but they are not undesirable citizens, they are not a drag on us, while the non-productive are precisely that.

I beg to point out here the utter error of the assertion so often made, that a rich man's wealth is, by the fact of his owning it, "taken away" from the masses. An idle man's wealth, except the part that he personally uses, is not by any means removed from the office of benefiting and sustaining his neighbors. Even the personal part, in the very act of being spent, assists to a slight extent in maintaining labor.

We cannot be too often reminded that wealth, in whosoever hands the title may be, cannot exist without employing labor, contributing to industry, helping people get their living.

Popular writers, and even professional economists, almost always ignore the vital distinction between the distribution of wealth and the distribution of titles to wealth. We shriek in horror that wealth is becoming dangerously concentrated, when all we mean is that the ownership of much wealth is coming into fewer hands. The fact is that as to its essential efficiency and helpfulness, wealth inevitably distributes itself. The ownership of wealth may vest in few or in many; the good of wealth tends to spread to all.

Suppose socialism. Then the people as a great public person would own all land and capital, as they now own all post-offices, naval ships and public lands. Proprietorship would be single—a one-person affair. But would not the good of the nation's wealth spread to all? Socialists contend that their system of single ownership is precisely the one under which the essential good of wealth does spread to all. I maintain that in socialism we should have painfully less wealth than under

a just system of private initiative and surveillance, but, in alleging that wealth as to its titles may be massed and as to its service very perfectly distributed, the socialists are quite right.

A wealth owner may be never so hoggish: he may care nothing for any one save himself, and raking the muck simply as convenient exercise for giving play to his motor nature. We are sorry: we like him less. He will devote a larger percentage of his winnings to vast expenditures and be less keenly awake to the just demands of benevolence. So long, however, as he piles higher the social store he is a valuable citizen. He is helpless to serve himself with his resources and not serve others at the same time. Suppose him to turn all his property into gold and have a celebration in dumping it into the sea. He must pay agents or banks to convert it and barrowmen to wheel it. Fortunately, greed itself insures against such folly and the unjust as well as the just prefer investment to destruction.

Benevolence may become socially dangerous like avarice. No man's wealth to-day is more active in social helpfulness than Mr. Carnegie's; but this is probably less true of what he gives away than of what he keeps. His sagacious investments, past and present, are no doubt his best boon to the public.

A prime question always in scientific benevolence is whether money in the form of a library, a church, a college or a gift to a missionary treasury will conduce to the weal of mankind as much as the same sum left invested in trade and employing labor. Donors often err in this matter and actually hurt society by their benefactions. Wealth engaged in carrying on the world's business is always useful. It matters comparatively little who owns it; it is helping you and me, the middle classes generally, and the poor.

I maintain in spite of all the assertions *contra* one hears now-a-days, the unconscious and the conscious socialism and communism that gets itself voiced on every hand, that the production of wealth is still the greatest factor in human progress, towering in importance above every question touching the distribution of wealth-titles. Titular distribution of wealth is more or less important. I wish proprietorship were more evenly passed around. I hope it will one day be so. But I should rather submit to almost any form of wealth-distribution than to the slightest falling off in the amount of the wealth created. Let wealth in mighty and ever increasing volumes come into existence, swell and spread: humanity cannot but flourish fairly. Whereas, if production declines and the dividend falls off, infinite haggling over distribution, even if successful, will leave us a poverty-stricken people.

LEGAL EDUCATION IN THE SOUTH.*

BY WILLIAM REYNOLDS VANCE, PH.D., LL.B.,

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During several recent meetings of this Section, and of the Association of American Law Schools, discussions of unsatisfactory educational conditions have been unnecessarily and unwisely localized. Low standards prevailing in the law schools of the States south of the Potomac, and the lack of adequate restrictions upon admission to the bar in those States, have been examined and set forth with a particularity and commented upon with a degree of candor that seem to indicate an abiding interest. This interest, however, would be more gratifying to Southerners were it not that sometimes the discussion has taken on that note of criticism arising out of superior wisdom and righteousness that used to characterize the discussion of the negro question a decade or so ago, before our friends in the North had come to realize that their Southern brethren were struggling as best they could under adverse conditions, but with all honesty of purpose, to solve an almost hopelessly difficult problem, best understood by themselves. So in these discussions of legal education and admission to the bar, it has been charged, by inference, that the Southern people are indifferent to the character and efficiency of their bar, and that those in charge of Southern law schools are not only lacking in foresight, but are without proper ideals, and for the unworthy purpose of attracting students who will pay fees from which salaries may be received, require little or no preliminary education before admission and an insufficient period of legal study before graduation. Certain crude utterances, indicative of an unhappy combination of ignorance and complacency, have been quoted from the proceedings of Bar Associations in Southern States as if they were representative of the sentiments of the members of the bar of the States in question, or as if such exhibitions were confined to the States south of the Potomac. The Southerners, also, dimly conscious of the dispute of '61, are perhaps a little too ready to take offense at candid utterance, and to stand aggressively on the defense. These precedents make the title of this paper "Legal Education in the South," an unfortunate one, as it seems to arraign the South upon the charge of general delinquency in matters pertaining to legal education, and to force the writer to present a brief for either the plaintiff or the defendant, and to put the whole discussion upon the plane of advocacy rather than of fair consideration and impartial judgment. Discussions of such character

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are relatively without value, and the point of view must be rectified. Hence I am entitled to this preface, which is quite like other prefaces, in that it has nothing particularly to do with the subject, but unlike the others in that it will be read—since I shall read it myself.

The figures that I shall use are taken from the recently issued advance sheets of the Report of the Commissioner of Education. These relate to the session of 1904-05, and, therefore, do not present exact conditions of to day, but the difficulty of securing from current catalogues sufficiently complete statistics to serve as a basis for reasonably accurate generalizations, has proved insurmountable. Indeed it seems to be peculiarly difficult to secure complete and accurate information concerning law schools. The inquirer too often receives from officials either no reply at all, or general remarks instead of specific facts. While the statistics reported by the Commissioner of Education for the session of 1904-05 are by all means the most nearly complete obtainable, they are yet far from being complete, or accurate in all respects, as anyone may perceive by examining the figures relating to any institution of which he has personal knowledge. Therefore, in presenting to you the figures that I shall later make use of, I would not be understood as holding them out to be any less unvarnished than figures usually are. Inspection of many recent catalogues justifies the conclusion that the number of law students in the United States has increased nearly 10 per cent during the two years that have elapsed since the year covered by the Commissioner's report, and that this increase is remarkably evenly distributed over all the States. Hence we can, in general, by adding 10 per cent to the figures used, arrive at results approximately representing the conditions existing at the present time.

I also wish to explain that when I speak of those law schools belonging to the Association of American Law Schools as superior schools, and those not members of the Association as inferior, I do not mean to say that I think that every school within that Association is better than any one without it. Such is not the case. In fact, there are a few schools in the country—like that of the University of North Carolina—which are fully eligible to membership in the Association but voluntarily remain out of it because unwilling to surrender in the least degree their unrestricted right of self-control. Further, no impartial man having knowledge of the matter can have any question but that the graduate of a two-years school of the type—let us say—of the University of Virginia, with its faculty of able and experienced professional teachers, its high standard both of scholarship and ethics, and its remorseless examinations, is far better trained for a useful career at the bar after two years devoted exclusively to exacting study of the law, than is the graduate of the night school, who during a period of

three years, gives the fag-ends of days spent in earning a livelihood, and the remnant of his strength, to the study of the law. Yet the latter school may be a member of the Association, while the former is ineligible. Nevertheless, there is a strong presumption that the school which lives up to the standards set by the Association is distinctly superior to the one that does not, just as there is a strong presumption that the young man who has an A.B. degree is better qualified for the successful study and practice of law than the one who has not, however contrary that presumption may be to the facts in any individual case.

Again, I shall have occasion to refer to night-schools as essentially inferior. I do not wish, however, to be counted among those who regard the night-school as inherently bad, and think there is no place for it in a properly developed scheme of legal education. While it must be admitted by all that the student who is under the necessity of giving a large portion of his time to other employment, whether it be in a law office in Chicago, the Government service in Washington, dining-room service at Cambridge, or playing football at New Haven, is seriously handicapped, and cannot, on the average, possibly accomplish as much in the great field of the law as his more fortunate fellow who can give all his working hours and his undivided strength to his legal studies; yet there are unquestionably many young men of high character and fine ability, well fitted by nature to be ornaments to the profession, whose circumstances are such that they cannot qualify for admission to the bar unless their studies may be so ordered as not to interfere with the primary necessity of earning at the same time a livelihood for themselves and possibly for others dependent upon them. For such students the night-school is a blessing, and should not be discouraged. Furthermore, actual experience shows that a surprisingly large percentage of the students in the better class of night-schools are men of more than average maturity and ability, possessing much more than the average power of concentration and determination to succeed in spite of all obstacles, and these men use so well the scraps of time left to them for legal study that their acquirements are out of all proportion to the amount of time available to them—and they do, as a fact, often emerge from a relatively thin course in a night-school better equipped for winning the highest success at the bar than many others who have all their time free for study, but use very little of it in that way. But it must not be supposed that such exceptional men succeed because of the instruction in the night-school. They would succeed with any kind of instruction. They belong to that class of men who are born to be lawyers, and who would train themselves for successful practice, if need were, without the night-school or any other school or instructor, with one law-book and a tallow dip or a

blazing pine-knot, perhaps—a class that has furnished so many brilliant self-trained judges, lawyers and even law-teachers, whose names adorn the history of the American bench and bar, and whose example has done so much to inspire eloquent protest in legislatures and Bar Association meetings against needed raising of standards for admission to the bar and right progress in legal education.

These exceptional men may well be left entirely out of our calculations when regulations are being established to govern the great mass of average men who desire to enter the legal profession. The poor young man who is predestined to become a great lawyer will as certainly surmount the obstacles which Examining Boards may set before him, as did the great self-trained lawyer of the past the even more serious difficulties that stood between him and his inevitable calling. But as for the average young man who works all day for a livelihood, the candid man must admit that the night-school can do little more than transfer to him such a knowledge of the law as a trade or handicraft, as will enable him to pass a bar examination. Therefore, the night-school would seem to be an inferior element in a progressive system of legal education, though possessing its proper function.

With these prefatory remarks concluded, we are ready to consider "Legal Education in the South." The reason why we consider legal education in the South, rather than in the West, or in New York, or Indiana, is because there is so little of it in the South, and that is supposed to be of such poor quality. On the surface this supposition seems to be well supported by the facts. In the whole country there are some 96 law schools which are in actual operation, and of such character as to possess significance as elements of our general educational system. Of these, 25 are in the 14 States south of the Potomac, including Texas, Arkansas and Oklahoma. The weakness and poverty of these schools in the South are pitifully apparent upon an inspection of the report of the Commissioner of Education referred to above. The average attendance at the Southern schools is only 59, while that of the 71 schools in the other States is 187, more than three times greater. On the other hand the average number of graduates reported by the Southern schools is 18, or 30 per cent of the average matriculation, while in the other schools the number is 15, or only eight per cent of the matriculates. The percentage of graduates in the South is largely increased by the relatively large one-year schools at Macon, Ga., and at Lebanon, Tenn., more's the pity. The average number of books in the library of the Southern law school is 1615, while the average number in the libraries of the 71 other schools is 7580. The professors in the average Southern law school, excluding assistants and lecturers, number three, while in the average school of the other States there are nine such professors. The returns as to revenues of

law schools are too incomplete to be of much value, but the aggregate of reported revenues of Southern schools, \$48,448, as compared with \$677,317, reported by the other schools, is very suggestive.

To continue in figures the sad story of legal education in the South, we note that only two of the 25 Southern schools are members of the Association of American Law Schools, while 33, or nearly one-half, of the other schools are within its membership. In the Southern States there are only four three year schools, and these are confined to the two States of North Carolina and Texas, while in the other States 50 such schools are to be found. In the South the States of Georgia and Tennessee have the bad eminence of furnishing, one each, the only two schools in the United States so disregardful of public sentiment and of duty toward the public, as to graduate students in law after one year's work. Nothing more meretricious and more reprehensible than the course of these schools can be discovered in the history of modern legal education, except that of the two year night-schools in New York City and in other large Northern cities.

Of the 95 law schools under consideration 32 impose practically no educational requirements for admission. Of these 19 are in the South, and only 13 in all the rest of the country. When we have added that only eight of the Southern States require candidates for admission to the bar to be examined in writing before a State examining board, that only four require a fixed term of preliminary legal study and only two any preliminary general education, and that the admission-on-diploma heresy has full sway in all but four, the case against legal education in the South is completed. As thus shown, it is bad enough, and seems to justify the uncomplimentary things that have been said about it before this body and elsewhere.

But let us examine the facts further, and I think it will be seen that however bad are the conditions in the South they are relatively not worse than in many other States of the Union, and that however properly we may endeavor to stimulate our Southern brethren to more rapid progress in raising standards of graduation in the law schools, and of admission to the bar, any localized charges of peculiar indifference to the public welfare or of low professional ideals, made against the bar or the people of the Southern States, are without justification. These damning figures which we have been examining have another and very different story to tell. Thus it appears that only two of the 25 Southern schools are night-schools, while 26 of the 71 other schools are of that class. With very few exceptions the professors in these Southern schools have withdrawn from active duties on the bench or at the bar, and devote their whole time and energy, every day in close personal contact with a relatively small body of students, teaching the law and the reason thereof, and inspiring in the young men

who come to be their friends, a warm and zealous love for and appreciation of the best traditions of a noble profession. In many of the other larger schools of the North and West, particularly in the night schools in the large cities, the personal contact of the student is confined to the treasurer who gathers the harvest of fees, and the monitor who inspires in him a very natural zeal for the noble art of cheating on examinations, while too often the interest of the professor in the school and in the students is proportioned to the one or two hours a week which he steals from the exacting duties of a large practice or of a bench cumbered with records, and even in this year of grace, 1907, is sometimes manifested by the reading of typewritten lectures to an outworn class.

The population of the Southern States is still rural and agricultural, and the number of lawyers needed for the conduct of its business is insignificantly small as compared with the number required in the commercial and manufacturing States of the North. In New York alone there are almost as many lawyers as in all the 14 Southern States. Nor have we any reason to think that the percentage of well-trained lawyers in the Southern States is materially smaller than in New York, for instance. In 1905 there were 14,014 students in all the law schools of the United States, of whom 1471, or about 10 per cent, were in the Southern law schools. An inspection of the catalogues of four leading Northern law schools for the same year shows that 160 young men from the South were registered in them. It is safe to conclude that at least 200 Southern students are being educated in the best Northern law schools members of the Association of American Law Schools. Add to these the 350 who are registered in the three Southern schools which enforce the requirements of the Association and we have a total of 550 of the 1671 Southern law students, or 33 per cent, who are supposedly receiving the best training to be had, while 1121 are being trained in inferior schools. In New York, in 1905, of 2768 law students there were registered in schools now enforcing the requirements of the Association of American Law Schools 734, or 26 per cent, who received the best training, while 2034 were receiving inferior training. That is to say, in New York State alone there were nearly twice as many men being inadequately educated for the duties and responsibilities of the profession as in the entire South. Nor, upon a candid survey of the whole question, can we conclude that the young men in the inferior New York schools have any advantage over the young men in the inferior Southern schools, save in the one respect of a better average preliminary education. On the other hand the record of Texas is quite the cleanest in the Union, in this respect. Not a single law student is being trained in that State who is not held up strictly to all the requirements of the best law schools, as fixed by

the Association of American Law Schools, while in North Carolina every student is preparing himself for his profession in a three-year day school.

But the educational delinquencies of New York, or of any other State, afford no excuse for the backwardness of the Southern States in matters pertaining to legal education and admission to the bar -- and that they are sadly backward has already been made apparent. All men of public spirit and broad sympathies, but especially those of us who know and love the South as our ancestral home, long to see this reproach removed, and, therefore, we seek earnestly for the needed means. Certainly, however, such means will never be found until the actual causes of the condition complained of are understood.

Let us look for a moment at the conditions of Southern life as they actually are. Not driven to the struggle with a rigorous climate and a reluctant soil which compelled the settlers of the North Country to congregate in villages and towns for the sake of mutual aid and protection, the Southern settlers established homesteads remote from one another, and, this tendency being further aided by the unfortunate institution of domestic slavery, the unit of Southern civilization became the essentially independent patriarchal plantation rather than the township or village community. The Southern civilization was almost exclusively rural, not urban; and despite the results of the war, and the great industrial progress of the last two decades, the urban element in the South still remains relatively very small. Thus the census of 1900 showed that only 15 per cent of the total population of the Southern States lived in towns and cities containing as many as 2500 people, while only about four per cent lived in cities of 100,000 or more. The corresponding percentages for the whole country were 59.8 per cent and 18.7 per cent while in New York 73 per cent of the population was urban, 60 per cent living in cities having 100,000 inhabitants or more.

The village school of the New England settlement, which soon developed into the graded common school and high school under continuous management, capable of giving certificates and diplomas, properly sealed and tied with a blue ribbon, was impossible in the South. The prosperous planter would have a governess and tutor, and the poorer children in the country got only such schooling as accident brought them. Frequently in the country communities subscription academies were established for the older boys, usually taught by young college graduates, pausing for a year or two for financial recuperation before taking light into one of the learned professions. These schools were often well taught and not a few of our most distinguished scholars owe their awakening and inspiration to some such evanescent academy "down South," but their courses were not continuous, shift

ing haplessly with rapid changes of teachers, and often discontinued altogether on account of a temporary decrease in the number of pupils in the community. Hence the preliminary education of the Southern youths, while often excellent in fact, was very defective in form and not well-rounded, and seldom bore such fruit as diplomas and blue ribbons. As the young men of the South seldom could obtain any regular preliminary education, the colleges and universities could not require any. If during his four years at college the Southern student learned a reasonable amount of Latin and Greek, a little mathematics, and a great deal of logic and history, and orated before the literary societies, he was graduated without considering whether he had read *Aurora Leigh* or *Enoch Arden* before he was admitted. And, curiously enough, it turned out that in many cases he was excellently well educated. For the same reason no one thought of requiring a high school certificate of the candidate for admission to the bar, or indeed any special legal training. The only question seriously considered was: Is he bright enough to be a lawyer, and can he speak well enough to "plead" causes? The shyster and the ambulance chaser were not much to be feared, for the profession was not then rich in anything but honor, and the lawyer who was not honored had little to keep him at the bar.

Much of the Old South has passed away, but the old system and the old habits of thought have left a deep impression that still endures. The population of the South is still largely rural; its common school system is yet undeveloped, and there are still large areas in the South where there are no high schools to which an ambitious farmer's son can turn for a high school course and the talisman certificate. He makes such shift as he can with ephemeral academies or irregular private schools, but seldom completes anything. Is it any wonder, then, that Southern colleges have been slow to close their gates to such a young man, and the legislatures have generally declined to bar him from the legal profession?

Despite the much vaunted progress in the South, the greater part of the people are still distressingly poor as compared with similar communities in the North. It is true that fortunes are now being made in manufactures, but there are no accumulated fortunes that endow colleges, or largely aid public enterprises. As a general rule the men who are making money rapidly are engrossed in that occupation, and take no thought of education of any kind save when the school laws interfere with the employment of profitable child labor. The dividends either go Northward or promptly into other and larger cotton mills, so that the general educational conditions is not so much improved as the prosperous census returns would lead us to expect. Save in a few larger cities, the practice of law is far from lucrative, and there

is little pressure to gain admission to the ranks of the profession. Able and ambitious young men are turning rather to business pursuits. As the commercial and manufacturing interests of the South increase in relative importance, and its population becomes more largely urban, the services of the lawyer will become more necessary, and more liberally compensated. The number of those seeking admission to the bar will greatly increase, and the placing of proper restrictions upon such admission will become a problem as serious as it now is in the commercial States of the North. At present, however, the disputes and business transactions incident to the life of an agricultural people do not often require in their settlement a very high degree of skill in the law, and the rewards of such primitive professional services offer little inducement to the highly trained lawyer.

Hence we perceive that the backwardness of the South in respect to legal education and admission to the bar is not due to indifference or to any peculiar depravity, but to the natural result of the working of economic conditions. Therefore, we do not condemn the actors, but rather regret the conditions under which they act, and commend highly those who have risen superior to their economic environment.

But there is one other phase of this subject which we must consider briefly in closing. The weaker law schools in the South—and they are many—which are dependent upon their daily revenue for their daily bread, cannot in the nature of things rise above local economic conditions. But to the strong institutions of the South, like the law schools of the State Universities, and of Washington and Lee, Tulane and Vanderbilt, to which temporarily failing patronage would be of little moment, we would commend the duty and privilege of the right law school to lead and not to follow, to direct the current of public opinion and not to float aimlessly upon it. The best is none too good, and in the upbuilding of the New South, she has need of well trained lawyers. Ill-trained ones are quite too expensive for a progressive people. **Three years are few enough to give to the huge task of training the student in even the fundamental principles of our complex jurisprudence and to a right view of his professional duty, and the admitted hardship of requiring an adequate preliminary education will diminish rapidly with the growth and development of the public school system, now so happily arousing the interest and aid of all public spirited Southerners, and will even under present conditions, in all cases yield to the proper determination of the young law student to start aright.** The example of the Law School of the University of Texas is noble and inspiring. Despite the fact that the requirements for admission to the bar in Texas do not include any considerable preliminary education, or any fixed term of legal study, that institution has resolutely required of its law students a sound high school educa-

tion before entering and three years of thorough work before graduation. After the next session it will go even further in its work of upbuilding the Texas bar, and will require for admission one year of work in college. We are glad to see that although the two famous Virginia schools which have always numbered so many Texans among their students, have refused to advance their standards or requirements, the Texas law school has flourished even more than the green-bay tree, and is now easily the largest and strongest law school in the South. The history of the North Carolina Law Schools is scarcely less glorious, and those of us who look to the Old Dominion as our home cannot but bow our heads in sorrow that the law schools of the University of Virginia and Washington and Lee, with their long and honorable careers, their high ideals and thorough work, their relatively great strength in resources and in distinguished and loyal alumni scattered thickly throughout the South, should have permitted Texas and Carolina to wrest from them a leadership that was historically their own, and presented to the rest of the country the distressing sight of Virginia a laggard among her sisters. In justice it should be said that the tardiness of these schools to make answer to the spirit of the time is not chargeable to their faculties, but to those "higher up," who have not yet seen the light. May they soon come to appreciate the real legal significance of the beautiful legend carved upon the facade of the great auditorium building overlooking the quadrangle at the University of Virginia, "Ye shall know the truth, and the truth shall make you free."

THE RELATION OF INDUSTRIAL COMBINATIONS
TO EXPORT TRADE.BY JAMES HOWARD GORE, PH.D.,
Professor of Mathematics.

The manufacturer in his efforts to develop an export trade finds problems and difficulties that did not confront him when he sought wider markets at home. The longer time that intervenes between the soliciting of an order and its filling has unlimited possibilities for fluctuations in prices of material, wages and transportation and the delays in settlement lock up capital that might be utilized several times over if the consumer had been nearer the producer. Laws affecting import duties may be changed in the interim, contracts to purchase may be broken with the annoying difficulties that meet a foreigner in attempting to secure enforcement by legal processes, and strikes that could not be anticipated months in advance might embarrass the manufacturer or cause him to meet his obligation at a sacrifice.

Still the advantages of an export trade to the producer, to the country and to the home consumer are so great that the dangers and difficulties just enumerated should be valiantly met by the manufacturer who, in return for the benefits he bestows, ought to have the aid of his government and the encouragement of his fellow citizens.

The good features of foreign trade are so manifestly axiomatic that their enumeration carries with it their demonstration. First and foremost is the widening of the circle of exchange, making the money involved purchase, before it completes its cycle, a larger variety of articles to meet the needs of a greater number of persons; then we have the bringing into the country in return for the goods sold abroad large sums that pay for domestic materials and wages which in their ramifications benefit countless multitudes; and finally there is the greater elasticity of production that an export trade makes possible. It is under this last category that we find some of the unappreciated benefits that come to those who buy from world purveyors.

By elasticity is meant the wider range made possible for the productive agencies so that the domestic demands in response to unexpected causes would not likely feel restricted. The concern that has created a foreign market can manufacture up to the predicted consumption at home and abroad and in the event of greater demands from neighboring consumers there is the chance of meeting them by allowing a part of the foreign business to fall into the hands of near by producers. Better still, such a concern is not held down to so close a margin above anticipated orders knowing that the surplus can find sales across the

seas. Then, too, great establishments can risk production on a scale that means maximum efficiency, confident that in case of tighter markets at home, they can sell their output abroad at prices low enough to catch the business without thereby fixing rates that could not be indefinitely maintained. From this greater efficiency the home consumer derives a permanent advantage, the foreign buyer an occasional gain, the factory avoids the loss incident to shutting down for a season and laborers are given continuous employment. In the possible disposition of surplus even at a small profit, or at cost, rather than its consignment to the almost valueless scrap, we have risks and profits so distributed as to give to the domestic buyer advantages that he could not enjoy if he dealt with a concern having a more contracted patronage.

Of course, a part of the benefits here mentioned are not exclusively inherent in establishments blessed with an export trade—they are equally present in concerns whose trade is wholly domestic. But it must be recognized as true that the industries which have assumed proportions great enough to insure the advantages named, have achieved these proportions in a great measure because of the widening circle of trade. However, a greater agency in extending these advantages is the possibility of disposing abroad of stock that becomes surplus because of changes in style, methods of operation, or results sought that made themselves felt locally before they could affect tastes or wants in distant lands. This might be conversely true. That is, the surplus of manufactures made for foreign consumption might, after the demand was met, be just the thing to satisfy a local want. To illustrate: Suppose there is a maker of harvesting implements whose resources of manufacture and distribution make it possible for him to send his machines into a narrow belt along which wheat ripens and must be cut within a fortnight. His output must be limited and with even the maximum permissible ratio of surplus to predicted demands, there is a very narrow margin for demands made extra by a heavier harvest and if this extra stock is consumed the added profits are insufficient to give a single purchaser an appreciable advantage. In contrast to this condition, let us think of a maker whose resources make it possible to cover the district from Central America to Canada. He has the wants of six weeks or more to meet, and can readily pass the glut of southern markets to fill the demands of northern farmers. Extend this field of activity until every clime is included, and the hungry reaper that finds no wheat upon the equator can go northward or southward following the sun as it ripens the wheat and every month furnishes needy buyers. The improvements suggested by the experience in the earlier harvest are placed in the latter sales, and the end of this late season is so near the beginning of a new season in another zone that the latter profits by the lessons learned in the former. And so, in

cyclic measure the leaves of the book of experience are turned and each is its predecessor's debtor. Simply change the article to be marketed and modify slightly the causes for varying demands and a fair picture will be presented of the advantages that accrue to each purchaser when the stall from which he buys is in the world's market.

For many years the energies of our people were expended in administering to the wants of one another and our rapidly growing population absorbed the output of shop and factory. Money came from abroad to seek investment and in staying here it became the purchasing power to meet wants which our prosperity engendered. High standards of living resulted from the ease with which desires were gratified and the wages paid made it possible to meet the standard set. But it was not possible to beget wealth by trading with one another, and the interest due abroad for investments made here must be paid.

It is not possible, nor is it necessary to our purpose if possible, to point with definiteness to the causes that brought about a realization of the need to increase our foreign trade, but a study of statistics will show that the results of the awakening came within the decade 1800-1900 when our total exports of manufactured articles increased from 204 millions to 666 millions, or per capita from \$32 to \$80, while our imports of merchandise of all sorts within the period named increased by only 60 millions with a decrease of \$1.47 per capita annually.

It was in this decade that the strong plea was made for reciprocity—the word appearing in political platforms for the first time in the enunciation of Republican principles by the convention of 1892. It is true, the reciprocal arrangements were thought of primarily in connection with our intercourse with the countries of South America, but the benefits of such trade relations were specifically stated as tending to materially increase our sales abroad. In this platform are found the words: "We point to the success of the Republican policy of reciprocity, under which our export trade has vastly increased and new and enlarged markets have been opened for the products of our farms and workshops . . . and claim that, executed by a Republican administration, our present laws will eventually give us control of the trade of the world."

In the Democratic convention of the same year it was deemed wise to endorse the principle of reciprocity but to take from the opposing party any credit that might come for its inception and introduction.

The Republican convention of 1896 met the criticism that reciprocity juggled with the people's desire for enlarged foreign markets and freer exchanges by pretending to establish closer trade relations for a country whose articles of export are almost exclusively agricultural products with other countries that are also agricultural, while erecting a custom house barrier of prohibitive tariff taxes against the richest

countries of the world that stand ready to take our entire surplus of products, and to exchange therefor commodities which are necessities and comforts of life among our own people. The platform adopted declared that "protection and reciprocity are twin measures of Republican policy and go hand in hand—protection for what we produce; free admission for the necessities of life which we do not produce; reciprocity agreements of mutual interests which gain open markets for us in return for our open markets to others. Protection builds up domestic industry and trade and secures our own market for ourselves; reciprocity builds up foreign trade and finds an outlet for our surplus." In 1904 the extension of our export trade was emphasized as the end sought, with reciprocity as a means thereto.

This brief extract from political history is cited simply to show that conventions, seeking to reflect public opinion rather than create it, saw the extension that should be given to our trade, gave their endorsement and sought to claim some credit by pointing to legislation which within the period of our great commercial activity had been enacted.

Economists would suggest other causes for the rapid development of our foreign trade and people arguing for or against industrial combinations will point to this extension as a confirmation of their contention.

Whatever may have been the agency that called this trade into existence, diverse as may have been the instrumentalities that have promoted it, so far as the future is concerned they are valueless unless they can suggest means for its further growth or at least check influences which threaten its retardation.

While there has been some fluctuation in our *total* exports, there has been a steady growth with an increasing ratio of gain in our export of manufactures from seven millions in 1820 to 686 millions in 1906. Our ability to sell food stuffs depends upon conditions over which the producer has no control and with the growing demands at home, the surplus available for sale abroad must diminish unless more intensive farming is practised. This becomes especially apparent when we find that while our population between 1800 and 1900 increased by 13,681,000, there were added within the same decade only 1,816,000 to the army of farm laborers of all classes. During the past year, 1,245,000 immigrants came to our shores, who, knowing but little of our agricultural methods and landing remote from our farming districts, have become consumers of food rather than producers. In 1906 our production of wheat exceeded our consumption by 97 million bushels while in 1900 this excess under crop conditions quite similar, was 186 million bushels. This great difference can be understood when we find that the per capita consumption between the dates named grew from 4.74 bushels to 7.08 bushels. In the case of corn the excess of production over consumption between 1900 and 1906 has suffered a loss of 74 million

bushels. To correct the impression that larger quantities of grain are year by year converted into meat and sold abroad as food products, only a glance is needed at the statistics of exports of all forms of meat and dairy products. They show that in 1900 we sold abroad products of this sort to the value of 184 millions dollars while our sales for 1906 amounted to only 169 millions.

This analysis must clearly show that our commercial prosperity can best be advanced by stimulating our manufactures, increase the number of our factory hands and artisans and feed to them our present surplus of food products. In this way we send abroad the raw materials of mine and forest, worked into shape under the direction of American ingenuity and fashioned by men nourished by the products of our boundless farms.

Out of a total export during 1906 of 686 millions of manufactured goods 608 millions came from establishments that might be characterized as trusts or industrial combinations. The relation, therefore, between concerns of this sort and our export trade is worthy of most careful attention. A very important feature that must be considered is the question of labor. Taking the most recent data available and assuming that concerns which engage in foreign trade employ in meeting that trade a number of workmen which bears to the total number employed what their foreign business does to their total output, we find that 216,000 persons are engaged in producing articles for consumption abroad. If each wage earner supports three individuals—which is regarded as a fair estimate—three-quarters of a million people in this country are directly dependent for a living upon our export trade. To this number should be added 7890 officers and salaried men whose services are similarly engaged. Each of these, as a rule, is the head of a household supporting that number of homes with their greater wants that must be met.

It is impossible to determine with any degree of precision the amount of capital invested in the concerns manufacturing for foreign markets, but the most authentic information places the aggregate between five and seven billions of dollars. The most casual consideration of these stupendous figures suggests that nothing hasty or ill-advised should be done that would jeopardize a trade which means so much to the nation as a bringer-in of money from abroad, which supports such a large army of workmen who are consumers of our farm products, which utilizes in the most profitable manner our wealth of raw materials, and upon whose profits so many stockholders scattered over the land rely for dividends.

This seems an opportune time for uttering a word of warning to stay the lynching spirit that animates legislatures to condemn corporations without indictment and suppress them by indictments instead of

trial, when States Attorneys levy a species of blackmail by compromising claims for three millions with \$200, when juries are exercising the right to define trusts, monopolies, and restraint of trade and fixing the fine with the exigency of the public treasury in mind.

There are men who failed to see opportunities or let them slip without seizing and now looking upon others' success bewail their failures and appeal for aid under the guise of clamoring for the protection of their fellows. They seek to stop evolution by revolution and ask Congress to stay progress by hasty and illy advised legislation.

To declare a corporation a trust is evidence of keen acumen; to denounce it as a monopoly shows deep concern for the productive agencies without the pale; and to file an indictment for restraint of trade is proof positive of an unselfish interest in the welfare of consumers. In the legislature of nearly every State in the union there are men who fully realize the value in prestige and votes of legislation aimed against the few who are successful under the specious plea that they are responsible in some mysterious way for the incompetency of others, and so, to win praise for watchfulness and fearlessness, they introduce measures against restraint of trade which as laws become the efficient means for restricting commerce, and acting as artificial checks force the foremost in the industrial race to wait for the hindmost to catch up, and enclose trade within narrow walls.

When the world is the market the business must be on equal magnitude. Co-operation of many men and the aggregation of their many small capitals are necessary to erect factories, to organize labor and secure the best results by opening markets for the exchange of manufactured products among all peoples. Still the field is open to all comers. New manufactories may be drawn into the association, but no monopoly is created for new ones spring up to take their places. Combinations controlling millions of dollars, with the world for a market, do not have a tithe of the influence in controlling that market that the formation of a partnership by two grocers has in the market of a country town. If we are to extend our foreign trade or even have it keep pace with our growing purchases from other lands there must be a keener appreciation of the fact that the magnitude of industrial association must correspond with the magnitude of the business done, that business cannot be kept within the artificial boundaries of countries and States, and that it is sheer madness to attempt to restrict business as that of a local manufactory may be restricted.

Past experience has revealed some of the abuses resulting from aggregations of capital. There have been many instances where monopolies exercised mercilessly powers granted to them. They were in practically all cases monopolies because of exclusive rights granted to them by the government and made secure by force when necessary. Without

such a grant or a basic patent under the government's seal, no association of men, no aggregation of capital can succeed in monopolizing trade for more than a brief period of time. Thorold Rogers in speaking of the reasons for the failure of the Dutch Indies Company says: "They kept up prices, and so limited consumption. They strained every nerve, exhausted their credit in their effort to keep by main force other traders out of the field, experience proving that the only way one can check competition is by lowering prices. In the expectation of getting one large profit on each transaction they succeeded in making a small profit or even loss on their transactions put together, for it costs more to protect a designedly narrow trade than it would to establish and render permanent an intentionally wide one. In brief, they narrowed their market and so narrowed their profit."

Every business association of the present day formed for any other purpose than to avail itself of the economic benefits of association, by means of which it may be enabled to lower prices and to extend its market has experienced, or will experience, the truth of the words just quoted.

The converse of this general proposition, mentioned once before, is equally true—the increase in production cheapens the cost to the consumer. It has been aptly said: "Wheat raised in Dakota, milled in Minnesota, carried to Boston and baked in the larger bakeries at a total cost of three and one-half cents per pound. Yet inferior bread baked in the small shops, is sold to the poor at six cents per pound. The cost is nearly doubled after capital has done its part. The cost of railway service does not amount to one-half cent per pound—the cost of retailing is five times that. The railroads carry meat from Kansas to New York for one cent per pound, but the added cost to the consumer after it leaves the railroad is five to ten times the railroad's charge. The country is convulsed by a slight rise in the price of coal, but the poor in our cities who buy coal in small lots pay 100 to 200 per cent above wholesale prices." The economy of the future will be largely in the saving of waste in retailing which averages 20 per cent of the price the consumer pays. Aggregated capital may be used to advantage in this direction.

Small capital, business done on credit and high interest make low wages, inferior workmen and bad work. Just in proportion as industry is rightly organized, the necessary capital invested, and a large trade sought by means of intelligence, economy and small profits, will this condition of affairs be improved. Instead of aggregated capital being responsible for low wages and high prices, it promises the only remedy.

Of the wealth now produced, workingmen receive 90 per cent, so it is claimed, and of the 10 per cent saved and set aside to become capital,

workingmen save and own one half. It is the remaining five per cent in the hands of the few which makes millionaires and causes so much apparent inequality. The only hope for a better future is in the creation of a greater amount of wealth by means of the improved use of natural forces, more perfect machinery, more effective methods of manufacture and distribution, greater utilization of the present waste of time, labor and material, and in the aggregation of capital necessary for their utilization.

Great concentration of capital resulting from combination of the capital of several concerns is usually called a trust. This term is also applied to a consolidation, combine, pool, or agreement of two or more concerns mutually competing, which establishes a limited monopoly with power to fix prices or rates in any industry or group of industries. If its purpose is to monopolize an industry, fix the price of raw materials, restrict production and enhance the selling price of the product, its existence as a factor in our hold upon foreign trade cannot and would not make amends for its pernicious methods.

The economies that are necessary in order to meet the cheaper labor abroad compel our industries to find locations that are most favorably situated with respect to raw material, power, facilities for distribution and many other elements that figure in the cost of production. A finished product may consist of parts most cheaply made in different localities and assembled in another, and it may happen that the various parts were until recently made by different concerns. Every principle of political economy and factory management would call for a consolidation of these various establishments because of the community of interests involved. If they should all be situated within a single State it would be a simple matter to combine in a joint stock company, but under our federal government an industrial corporation is the creature of the State in which it is organized. If permitted to do business other than commercial in another State, it is only by interstate comity and may be excluded under the provisions of a State law based on antipathy to combinations, the color of the hair of its president, or the grade of cigars he smokes. States are extremely jealous of foreign corporations. In some they are not allowed to hold real-estate. In others they are discriminated against by taxation, the effort having been repeatedly made—sometimes with success—to tax foreign corporations doing business in a State upon the entire capital. This demand to consolidate or to locate constituent elements of production in other States with local stockholders and officers suggested that the stockholders surrender their stock certificates into the hands of trustees and take from them certificates showing the amount of interest thus surrendered. This method, first adopted about 30 years ago, called into use the term trust. If every share of stock in the constituent companies represented actual value and if all

shares were surrendered in return for certificates calling for the exact amount surrendered the vicious attempts to control with comparatively few shares a number of concerns by holding a majority of shares of the trust would not have aroused such antagonism as to induce the half dozen trusts that came into existence to voluntarily dissolve and be converted into large corporations. The war against trusts becomes a war against corporations, though in the public mind the former term will survive.

If it be admitted that business of a magnitude to overleap State boundaries and be commensurate with the nation is to be tolerated in the United States, then the industrial combination must also be tolerated, or the law must legalize some device to take its place.

When the rights of States were granted to us in our Constitution, there was no dream of the present ramifications of commerce. Steam and electricity in their economic utilization must regard the boundaries of States as artificial as those which delimit a town or county. New Orleans and Seattle are as near to Chicago as were Danville and Peoria a half-a-century ago and Federal license would be just as appropriate to-day as was a city charter when our industries were in their beginnings.

There is nothing inherently evil in trusts; like all other business combinations, whether partnerships, associations, or corporations, they are evil if organized and conducted for evil purposes, and beneficial if organized and conducted for legitimate ends. Increased concentration of capital and commercial power finds its justification and warranty for existence in giving to the community better service either in superior quality or inferior price of its product. Every attempt to ignore this principle has met with disaster and each effort to exploit the community through higher prices instead of exploiting nature through improved methods of production, administration and distribution will spell ruin.

It is the community made up of capitalist and laborer that creates the wide demand, furnishing the greater consumption which is the market that makes aggregations of capital profitable. A disregard of the obligations to the community in the attempt to lessen, because of the greater resources, the expense of production and at the same time put up the price of the product through a control of the market, is responsible for the ill-repute into which some of the combinations have fallen and the suspicion under which the others rest.

There is at hand an efficacious means for putting an end to this economic rapine. It needs no legislation to call it into existence nor new machinery to make it effective. It lies in the extension of the functions of our very excellent Census Bureau, coupled with the Bureau of Statistics, Bureau of Corporations and Bureau of Manu-

factures, by which the American people as consumers and potential producers can be informed as to the price of materials, cost of production and selling prices demanded. If the difference between costs and prices assume, in the minds of those who know, undue proportions, two results will inevitably follow: A curtailing of consumption, and the inducing of idle capital to embark upon a business that seems so promising.

Real, active competition does not have half the terror that probable, potential competition has. Money is now abundant, ordinary securities pay low rates, and capital tempted by our prosperity is ready for industrial ventures. However greedy a concern might be, self-preservation would be motive enough to induce it to keep the price by the introduction of every possible improvement and economy so steadily on the downward move that competitors would refrain from the attempt to undermine.

There is no fallacy so widespread and so provocative of nagging legislation as the idea that industrial combinations seek through monopolistic control to fix costs and prices beneficial to themselves while harmful to the community. No one knows better nor appreciates more keenly than do the managers of great industries that safety rests in small margins and profits must come from large sales.

Paternalistic legislation is hurtful if it keeps in existence competition, that is expensive because inefficient. It is reactionary if it, in suppressing large corporations, reverses our policy of industrial freedom and in demanding individual producers in lieu of corporate concerns it throws us back to the time of the hand loom, sickle and pushcart.

Resolve the railroad corporations into their integral concerns and we find ourselves in the midst of conditions that prevailed 30 years ago. Prohibit co-operative industries and we will see the farmer journey from wood-worker to black-smith shop and then to the painter to have made a plow which he can now buy with the time these journeys would cost. Restrict production to single lines and we would find in scrap heaps waste materials that now meet the cost of production.

In our country's youth surplus capital was not available for the creation of great enterprises and foreign money was slow to come so far for investment in precarious industries, so man associated himself with man, joined his small means to that of others and in co-operation achieved results which, in older countries, might have rewarded individual efforts. Small concerns thus created paid the penalty of their success in seeing rivals come into the field who, conscious of local conditions only, produced when demands were great, and heartlessly discharged their workmen when markets were glutted. In the absence of widening markets profits were sought in cutting prices with

the accompanying result of failures and uncertain adjustments of supplies to demands. Stability required larger organization and so small concerns merged into greater establishments and more men became interested in their management. They were democratic organizations suited to our democratic instincts. In the natural economic development, greater concentration of capital was needed to make possible a more minute differentiation of talent and a higher integration of industrial energy, until now we have a precision that means accurate relation of supply to demand; organized employers treating with organized labor insuring permanency in production; and elaborated means of distribution reaching the uttermost parts of the earth and making the world our market.

The giant who is only a bully merits our contempt, and the great corporation that abuses its opportunities to benefit the community deserves our condemnation. Twenty centuries have placed an ever strengthening seal of approval upon the injunction: "By their fruits ye shall know them." The least attractive blossom may give way to the most luscious fruit. Fire can burn and water drown, but rightly conjoined they form the living breath of the world's activities. Dynamite can wreck a home and kill the innocent, but it can likewise loosen the sculptor's marble or break down the miner's coal. Religion has been made a cloak for vice, faith has at times degenerated into bigotry, and charity sometimes promotes pauperism, but no one proposes that **we dispense with religion, faith, or charity.**

There are dangers in concentrated capital and evils in industrial combinations, but the problem should be to eradicate all that is bad and curb everything that is threatening. The wounded soldier was killed before surgery came to amputate a lacerated limb and give to its owner life and usefulness.

The cobbler working at his bench must await his customer and to-day's patch differs not a whit from yesterday's; the individual workman with his one apprentice can know at most the needs of his neighborhood but his conception of style and quality is no larger than his sphere of activity; the employer of a score of workmen may become acquainted with the wants of his town and in his leisure hours ascertain enough regarding the prices asked by his competitor to impel closer attention to economies in order to meet them; the head of a large concern sends his representatives throughout his state, and in seeking wider markets, new materials may be found or better styles and methods of manufacture discovered.

As productive methods become more and more specialized, expert management is more and more demanded and the purchaser of the smallest fraction of the output reaps the benefits of this superior skill. When the market is world-wide, we have the highest example of busi-

ness acumen, for nothing less could search out unsuspected buyers; we have the most conservative management, for recklessness would be fatal when months intervene between orders and settlement; we have the closest study of economies of production for loss of trade has sharpened the wit of every competitor; and we have through the greater elasticity of foreign trade a more sure response to every demand.

The capital has grown from the dollar or two needed to buy the cobbler's awl and hammer to the millions required to engage the world's trade. These millions are giving us cheaper goods; they are widening our knowledge and broadening our sympathies; they are knitting peoples together through common wants; they are steadying economic conditions and deferring panics; they vouchsafe to labor remunerative employment; they take materials to waiting factories, transmute them into acceptable forms and set them down in every quarter of the globe where lips have framed a heart's desire.

In return for this, these millions deserve just returns, and as long as they ask that alone, it will surely come. And we, the beneficiaries of all that results from this last stage in the economic development of our country, ask a cessation of the activities of those demagogues who, seeking to emulate others, ignorantly and evilly assail concentrated capital in periods of popular prejudice by grotesque legislation and hamper its usefulness by uneconomic laws.*

* Read before the National Conference on Trusts, Chicago, October 25, 1907. To this Conference the author was a delegate from the District of Columbia.

THE KANTIAN BASIS OF AGNOSTICISM.*

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Agnosticism is nothing new in the history of human speculation. For centuries it paraded under the name of scepticism, until in 1860 Huxley christened or rather paganed it as agnosticism. We might question the propriety of his borrowing the etymology¹ from St. Paul's speech on Mars Hill, when he found the Athenians worshipping before an altar to *The Unknown God*. They were worshipping a real god—a being who had made some divine revelation—but they were only ignorant as to just which one of the gods it was—Zeus, Apollo or Minerva. An unknowable God is not worshipful. The Athenians had no thought that the unknown God was unknowable. In fact they worshipped, because they believed that some one of the gods—just which one of them being unknown—had performed some divine act on the spot where they reared the altar. So far the god was known to them. Doubtless they expected to learn which one of the gods it was who had done the deed and then they would put his name in place of *The Unknown God*, on the superscription. And this was what St. Paul proposed to do—to give them knowledge of the unknown but not unknowable God whom they worshipped.

Agnostics worship nothing. For the unknowable means the non-existent for human beings. The modern term agnosticism, however, is differentiated from the scepticism of earlier schools of philosophy, by its application of the term to God. It signifies the inability of the organ of knowledge to know God, because it asserts that man can only know the finite and sensuous. Scepticism is the broader term, as it has often maintained that man cannot really know anything, sensuous or otherwise, not even that he knows that he cannot know.

Modern philosophical agnosticism—man cannot know the Absolute or God—is generally accompanied by the most dogmatic and uncritical sort of gnosticism as to the finite and sensuous. Gnosis is merely another term for science—Greek (*γνῶσις*) instead of Latin (*scientia*).

Modern science is dogmatically gnostic. The foundation for modern the logical agnosticism and scientific gnosticism was laid in Kant's *Critique of The Pure Reason* in 1781.

Hume had analyzed all knowledge—scientific as well as theological, and proclaimed the impossibility or the invalidity of all forms of

* This paper is printed in the form in which it was delivered to a class in the course on *The Philosophy of Religion*. It forms a part of the Epistemological Section, where the critical bases of Agnosticism and Gnosticism are examined, preparatory to a critical evaluation of religious and theological knowledge.

¹ Huxley's *Col. Essays*, V. 239

knowledge except that of *unrelated sensations*. All the relating tissues between one sense impression and another—that of cause and effect in particular—were held to be but figments of the mind. Thus he left even the sense-world in a senseless chaos, because of the inability of the mind to know relations. Thus the foundations of modern physical science as well as those of theology were invalidated. This absolute agnosticism gave an unthinkable, unknowable world. This was uncomfortable, unendurable to man as a thinking, knowing being. It woke Kant up and set him about making a new analysis of the organ of knowledge. Hume was an absolute empiricist—the *consistent* empiricist and agnostic.² A consistent sensationalist must be speechless or utter but a series of disconnected sounds parallel with a series of unrelated sensations.

But man is not thus speechless because he is not a sensationalist. He has at least some knowledge—that of mathematics and that of physics. Can it be that this knowledge is invalid? Kant said let us analyze experience anew. Let us see the constituents of this knowledge—whether it can be resolved into agglomerations of sensations and the work of the imagination.

What is knowledge—at least that which we call physical science? What are the conditions that make it possible? We note only the result of it as bearing on the capacity of man to know the Absolute or God.

Granting that in his analysis of knowledge he threw the emphasis off of the sensational element and showed that the far larger contribution was made by the constitution of the mind, he still limited the field of knowledge to the data of sensation. He held it to be impossible for knowledge to extend to sense-transcendent subject-matter, or to this sensuous subject-matter as knowable by higher forms or categories. Thus it was impossible to know God and impossible to know the knowing self. Only the empirical *ego* could be known. And God could only be known if He were an empirical sensuous object.

We may well grant the very great and important place of Kant in the development of philosophy. But we may controvert the whole of his first *Critique*, beginning with his false conception of knowledge.

What is the nature of knowledge? Its fundamental essence is that it is an apprehension of reality. Here the empiricists are right in making sensuous data *real* and not mere appearances, i. e., if they confine knowledge to them. And this is the point which Kant attacked, in order to controvert their mere sensationalism. But he thus took the position that knowledge is never knowledge of realities, of things in themselves, but only of phenomena, of appearances. But then Kant held beyond and against sensationalists that knowledge of these phenom-

² Cf. at length my paper on Locke, Berkeley & Hume, The George Washington University Bulletin, December, 1904, pp. 1-26.

ena is not a mere mechanical result of their jostlings and juxtapositions and sequences, but the result of mind, of the active synthesis of universal and necessary forms of thought. We need not hesitate to acknowledge the immense advance thus made by Kant in his vindication of the place of mind in the web of ordered experience. This may be put in one of his own sentences: "... *Macht zwar der Verstand die Natur aber er schafft sie nicht.*" That is, it is mind—the active synthetic activity of mind, that gives us our world of *ordered* experience, science, knowledge. It *forms* that world. That world is objective only through this synthesis in universal and necessary forms of thought. Apart from this activity of the mind we should only have the chaos (*Gewühl*) of isolated, subjective sensations. This Hume showed to be the only possible world for the sensationalist. The understanding forms, makes (*macht*) nature as an *ordered objective* system. But it does not create (*schafft*) nature. That is, it does not create the stuff, the woof, the raw and heterogenous and disorganized data of sensation. There is something *given*, heterogenous to mind.

Mind is not a mere mirror of an external nature, with no other function than that of accepting a copy of it ready made. It is not a "waxen tablet" upon which the senses engrave ideas, or an "empty chamber" into which they pour them. But it really *makes* this intelligent nature by molding all the raw materials into its own forms. It spaces and times this material. It orders it into definite quantities and binds it into fixed relations of cause and effect, substance and accident. In a word, it *makes* the intelligent *objective* world of nature. That is, it is objective, not in the sense of being external to mind, but as being constituted in universal and necessary forms. Mind can thus know only as it creates. Mind creates the intelligent form of nature, but it does not create the material—the stuff—the woof, the raw disorganized and heterogenous *Gewühl* of sensation. There is something *given* which it does not create, and yet this *given* is not passively received as by a waxen tablet. This *given* is not exactly our sensations. For in sensation mind is active and transforms what it receives. Thus Kant does not say that our sensations—the *matter* of our knowledge, is *given* to us *a posteriori*. What he says is that the matter (or stuff) of our *sensations* is given. Our sensations are not given. They are ours by active construction. Still back of them, for Kant, lies something unknown which mind makes into sensations. He calls it *the matter of our sensations*, not matter as we know it in space, for that is a mind-constructed matter, but matter as some inscrutable ground, source or cause of the mind forming its sensations. This he calls the *Ding an sich*, that never enters into experience or into our known world. As opposed to empiricism the whole of our experience is subjective, mind-included. Even the raw stuff of this world is not

a *given* matter. The *given*—the unknown element can never enter in as it is, but only as it is *received*. It is thus transformed. Sensations are subjective. But they are—as transformations of the *given* element—only phenomena—only appearances. That is, they are our own subjective representations of the unknowable *Ding an sich* that furnishes their *given* element. Our sensations, the raw material, then, are not given us externally, mechanically, *a posteriori*. Our sensations are ours—our constructs of an unknown given element. That is Kant's doctrine. It makes the stuff of the whole of *nature*, of experience to be phenomenal, i. e., our sensations. Within this realm there is no merely *given*—no gross external matter. It is the world as it appears to, as it is made by, mind. It is our known world and yet not the absolute reality, but only phenomenal. This is Kant's doctrine of transcendental idealism or of the ideality of all phenomena. It is most sharply to be distinguished from any form of materialism. So, too, is his doctrine of knowledge to be most sharply distinguished from any sensational or mechanical copying process. The whole of the emphasis is placed upon the active synthetic processes of the mind—active in sensation as well as in understanding. This he shows in his *Aesthetic* and *Analytic*. We are not here concerned to make any detailed analysis of his doctrine. We only note the emphasis placed upon the knower—the efficient presence of mind in the whole realm of experience. The knower is not in space and time, is not an object or a relation between objects. But space and time and all relations between mind-constituted objects are in mind. It is true that our bodies and our empirical egos are also mere phenomena for the knower. That is, we must carefully distinguish Kant's doctrine from that of empirical idealism. This is difficult to do, and something that Kant himself often failed to do. Perhaps it would be better to substitute the term *knowledge* for that of the knower. For "the transcendental ego of apperception"—the source of the categories, the activity of knowing is never an empirical, subjective individual, but rather a transcendent logical presupposition—like the unknown *Ding an sich* at the basis of sensation. Each of these is, for Kant, an unknown and unknowable X—but also a necessary presupposition of knowledge.

The *Ding an sich*—the noumenon, the absolute, the real reality at each end of knowledge is not only unknown but unknowable. This is Kant's explicit form of agnosticism. But to reach this let us begin again and state Kant's fundamental problem and its solution. His fundamental problem was that of knowledge—that is, the question of epistemology, of the origin, nature, validity and limits of knowledge.

What are the conditions of the *possibility* of knowledge, or of ordered experience as we know it? That is the problem of his first *Critique*. To answer this he makes his analysis of knowledge and

tries to show the various *synthetic* conditions it implies—the various constitutive transcendental (not transcendent) relations without which we should not have our known world of experience. The whole of this analysis made dead against the sensationalist account of knowledge—even against that of empirical idealism—the early view of Berkeley, and that of Locke, Hume, Mill, Huxley and Spencer.

The *Aesthetic* is an analysis of the origin and elements of knowledge in *sensation*. For our cognitive faculty has two branches—sensibility (*Sinnlichkeit*) and understanding (*Verstand*).

Sense is an active faculty of mind. The sensuousness of the *Pure Reason* is Kant's starting point. We get the stuff of knowledge in sensation. But sensation, as we have seen, is not a mere mechanical reception of some external reality. Sensations are mind-made stuff—but made from an unknown stuff—a *Ding an sich* wholly without the realm of experience and hence forever unknowable.

Our sensations are our own—not some external things. For there can be no external things to mind in knowing. Even the *Ding an sich* is not external—something in space outside of us. Our sensations are mind made. Then mind *orders* them in space and time which are *a priori* forms of the mind. They are all merely phenomena—things as they appear to thing-making mind, which proceeds to know them by spacing and timing them. Knowing is not in space and time, but on the contrary space and time are the active synthetic conditions, imposed by mind on its sensations. This is the first point to be clearly seen and firmly held as the true Kantian doctrine, i. e., the mind-made character of sensations. With this goes his second point, that sensations are mere *phenomena*—the mind's representations of an unknown *Ding an sich*. Hence knowing is concerned only with phenomena, never with reality. It is at least only reality as it is conditioned by the sensuous character of *Pure Reason*.

Absolute reality is non-sensuous. Experience is confined to the sensuous. The non-sensuous is never sensuous and so never comes within the realm of *Pure Reason*. By sense, Kant of course never means merely organs of sense. They, too, are mere mind-made phenomena. But sense is an active branch of *Pure Reason*, which compels everything to be subject to its capacity of receiving, under its own terms, an unknown given from a *Ding an sich*. These mind-made sensations are the indeterminate matter of phenomena, while time and space are the forms of phenomena. The whole subject-matter of knowledge, in the more advanced stage is mind-made and mind-formed and mind arranged phenomena. But back of the realm of experience—Kant could not say, external to or causal of this world—lies the *Ding an sich*—the unknown and forever unknowable *noumenon* or ultimate reality.

While the *Aesthetic* is relatively the least conspicuous part of Kant's theory of knowledge, it is fundamentally the most important, for it

does these two things: 1st. It maintains that an analysis of knowledge shows that sensations are the mind-made and mind-formed stuff of our conceptual knowledge—without which all such knowledge would be the clattering of empty mills with no grist to grind. "Conceptions without perceptions are empty." These, it is true, are mere phenomena, but they are the real stuff and woof of our known world. They are transcendently ideal, but empirically they are real. This is what Kant affirms at the close of the *Aesthetic*, that his view is transcendental idealism and at the same time empirical realism. It is idealism he says because of "the fundamental nature of sensuous knowledge." "What we meant to assert was this, that all our intuition is nothing but the representation of phenomena: that if we drop our subject or the subjective form of our sensibility, all qualities, all relations of objects in space and time, nay, space and time themselves, would vanish. They cannot, as phenomena, exist by themselves, but only in us." 2d. It is empirical realism because he maintains that these idealities—these phenomena are the only things that we know or can know. This latter point is brought out most clearly as the second part of his transcendental deduction of the categories.

But the *Aesthetic* also gives Kant's fundamental ground for agnosticism. That is, it implicates, in a way inexplicable, an unknown *given* element—a transcendent *Ding an sich*. Of course Kant cannot maintain that this noumenon *exists* or is a *cause*, as existence and cause are categories applicable only to phenomena. Still, consistently or not, Kant does affirm the reality of this transcendent noumenon. In fact his system of knowledge of only phenomena demanded it. But it is something not external to phenomena nor immanent in them. It is at best a limitative conception, necessary to ground his doctrine of phenomenalism.

We need not pause to criticise this doctrine of Kant. We care only to make it sure that he held it. He held to this noumenon as the *given* element in sensation, the substratum of all internal and external phenomena. He also held it to be the real reality underlying our empirically real world of mere phenomena. But when he goes on to maintain its absolute incognoscibility—a something that is predicateless—a mere *thatness* with no *whatness*, he deprives us of any ground whatever for maintaining the reality of the unknown and unknowable *given*. We are not here concerned with the doctrine of the *mundus intelligibilis* and the *causality of freedom* in his *Second Critique*, for that is professedly outside the sphere of knowledge. In fact, in neither his *Second* or *Third Critiques* does he ever transcend the theory of knowledge and its allied and affirmed agnosticism of the first *Critique*—nescient as to *real* reality.

Let us turn to a brief statement of his doctrine of knowledge in the second part of his first *Critique*--the *Analytic*--an analysis of the conceptual forms or categories or relations implied in all knowledge.

As conceptions without perceptions are empty, so perceptions without conceptions are blind. The active synthetic activity of mind is needed to relate into order and system and causal relation the sensation-stuff of experience.

What are the necessary and *a priori* forms of synthesis in a known world? And how are these *a priori* synthetic judgments possible? They are possible (1) because without them we could not have knowledge. They are the necessary conditions of the possibility of experience as a rational system or cosmos. But (2) this necessary character of the categories is itself rendered possible and grounded on what he calls the *transcendental unity of apperception* or self consciousness. The active synthesis of stuff into related, connected, rational experience by the use of the categories is only possible under the supreme condition that the *Ich denke muss alle meine Vorstellungen begleiten können*. That is, there must be a *permanent ego* which remains unchanged throughout the passing flux of experience, both inner and outer or, that of the empirical ego and of the external world. All these phenomena can be synthesized only in relation to a permanent identical self. To state the matter again, synthetic *a priori* judgments are possible, (1) because they are indispensable for the determination or knowing of phenomena. (2) But necessary as they thus are, they are only possible as forms of the synthetic activity of a permanent, identical ego. The "I think" or an identical consciousness must be present in all stages of the synthetic process, if it is to be held together as a whole. There must be a permanent self that experienced something yesterday that is bound casually or otherwise with something experienced to-day, or knowledge would be impossible. That is, knowledge implies a permanent knower as the source of the categories and the consequent relationing of disconnected sensations. He maintains that "the 'I think' is an act of spontaneity that cannot possibly be due to sense" and that these unities, or relations binding many into one, cannot be picked up like particulars in experience. They are furnished by knowing mind.

But here we come upon another phase of his agnosticism. This transcendental ego, or permanent self consciousness is only a logical or limitative conception, like the *Ding an sich* back of sensations. This transcendental ego, the source of the categories and the necessary presupposition of experience as a connected web of phenomena; this knower that knows is itself unknown and unknowable. This source of the categories can itself be brought under none of its own categories that are essential for knowledge. You cannot put it in space or time; cannot predicate reality or causality of it. This is proven by the second

part of his *transcendental deduction of the categories*. That was his proof that these categories, these synthetic unities, are applicable *only* to objects of sensation or phenomena. What alone are synthesized are sensations—into objects in perception and into *related* objects, especially causally and reciprocally related, in the system of experience. That is, the categories are applicable only to that element of experience that comes from sensation. Hence they are not applicable to the *Ding an sich*, the unknown background or *given* element in sensation, nor to the *transcendental ego* or unity of consciousness, at the other end.

Thus Kant's epistemology—the necessary elements in valid knowledge—never gives us a *res completa*. At each end there is an unknowable *given* element that cannot be intelligized, rationalized, known. Knowledge is a continent betwixt two oceans of nescience.

The *given* element in fundamental sensation is unknowable. And the knower is unknowable. For it must be borne in mind that Kant never identifies the transcendental unity of consciousness with that of the empirical ego. The empirical ego is a construct from sensations. Psychology is only internal physics. The passing inner experiences of the empirical ego are synthesized by the same categories and in the same necessary and mechanical way that external phenomena are. Man, as a natural individual, both as to body and mind, belongs to the phenomena of nature and is a part of the sense-world. He is in space and in time. Space and time are not in him as they are in the unknowable knower in sense perception. His passing psychoses are subject to the same categories as are the neuroses of his body. He is not the source of the categories but is subject to them. That is, after all, the knowing subject, the knower, is unknowable. It becomes an impersonal and merely logical unity, devoid of predicates and cognoscibility. In no place does he hint that this transcendental ego is, in some way, immanent in the empirical ego. In no place does he solve the relation between the permanent "I think" and the thinking of the empirical individual. Knowledge thus analyzed becomes a sort of objective impersonal activity, and individual egos are reduced to being mere phenomena among other phenomena that knowing knows, without being known.

We are not now concerned with the advance made by Kant in his second and third *Critiques*, nor with that made by Fichte, Schopenhauer and Hegel. We care only to give his epistemology or the *ry* of the origin, validity and limits of knowledge. He confines knowledge to sensuous data, to phenomena.

We do not care, even to emphasize the fact that his *Critique* really contradicts this. For it is a theory or a *knowing of knowledge*, of the *a priori* organism of knowledge itself, which is not sensuous or phenomenal. The *Critique* aims at giving us a knowledge of the organization

or constitution of the *Pure Reason*. It is a knowledge of knowing and not merely a knowledge of phenomena.

We are not concerned even to be sure that Kant was always a believer in the reality of God, in rather a mechanical, deistical way, nor that he held firmly to the immortality of the moral self. We note only that he relegated God and soul out of the realm of *knowledge* into that of *faith* and of the *practical reason*, even though he insisted that these were higher than knowledge. He expressly says the faith is higher and gives the primacy to the *Practical Reason*.

We are here only concerned with the philosophical or rather the epistemological basis which Kant's *First Critique* gave for both scientific gnosticism and theological agnosticism.

Kant vindicates our knowledge of nature—gives the basis for rational physical science. But his validating this knowledge is at the same time an invalidating of the knowledge of real realities—noumena like God and the soul with which metaphysics busies itself. Metaphysics, knowledge of non-sensuous phenomena, is for him at best a *pseudo-science*. This he shows in the third part of his *First Critique*—the *Dialectic*. There he does elaborately what he had already done most concisely and positively in the *Aesthetic* and *Analytic*.

The transcendental ego or the rational soul is not knowable. To attempt to know it leads only to specious paralogisms of reason. The phenomenal soul, the empirical ego is knowable, but must never be confused with the transcendental ego, the permanent unity of consciousness of knowledge. Nor can the cosmos as a completed totality be known. The cosmos as a *res completa* is merely an idea of reason—a limiting and subservient ideal.

Nor can God be known. The proofs of his existence are disproven. He cannot be known because He is not a phenomenon—a piece of the sense world, nor even an immanent constitutive element of that world.

In fact the *Dialectic* is an unnecessary appendage to the *Aesthetic* and *Analytic*. At most it is an application of the theory of knowledge there elaborated to noumena. All knowledge is of sensuous, conditioned, phenomenal subject-matter. Noumena, like God and the soul, are non-sensuous. Hence they are unknowable.

No theist professes that God is only a phenomenon—one among the many and so there is no need of a phenomenological research to find that He is not findable. The whole of the *Dialectic*—at least its positive doctrine of nescience is contained in the earlier parts of the *Critique*.

Eye cannot see—the strongest microscope cannot discover the soul, nor the most powerful telescope find God, unless the soul and God are mental constructs of sensuous data. What need then for the elaborate disproof of rational psychology and rational theology in the *Dialectic*?

What need to go into detailed proof that we cannot know the supersensuous, because it is not sensuously perceptible? But Kant's nescient view goes further. It divorces epistemology from ontology. It maintains that our knowledge is not knowledge of realities but only of phenomena, of appearance in which realities do not even appear or manifest themselves. But a knowledge that is not a knowledge of reality is really nescience. Our knowledge of supersensuous realities is *pseudo*-knowledge. But then, too, our knowledge of sensuous phenomena is only real knowledge of *unreal things*. That is the sum and substance of the negative part of Kant's epistemology.

And yet this is not quite all. For Kant attributes to phenomena reality and actuality. These are categories applicable to sensuous data. That is, phenomena are real for knowledge, real and actual in themselves and not as phenomena of noumena, or appearances of real reality. They are the only reals of knowledge, but they are so real, so existent and actual, while noumena are neither real nor existent, that they become the only realities for knowing. Thus in the first *Critique*, noumena are absolutely barred out from experience and allowed, at best, to enjoy as Jacobi wittily said an *otium cum dignitate*. We may merely refer to two other facts, that show how phenomena came to be looked upon as the real and only realities.

The first is, that in his second edition of the *First Critique*, he adds a paragraph on "the refutation of idealism" in which he attributed to external things, bodies, matter, etc., an existence—independent of our thought—thus really making them to be things in themselves. It is needless to say that this added paragraph is in absolute opposition to the fundamental principles of his whole theory.

Schopenhauer thus criticises Kant's "*Refutation of Idealism*": "With the frivolity as well as timidity characteristic of old age, Kant in his latter years actually retracted the views he had formed of the relation of the ideal and the real, which he had embraced in the vigor of his understanding, and which he ever afterward cherished, etc."

The second fact is that the most rigidly literal disciples of Kant—the neo-Kantians—hold that our knowledge must be confined to sensible objects and sensible experience as these are all that we can have. That is, they became absolute empiricists and dismissed the ghost of any *Ding an sich*. They expressly maintained that phenomena are noumena—the only existent *Dinge an sich*.

We believe Kant's "*Refutation of Idealism*" to be un-Kantian. We also believe that neo-Kantianism is not Kantianism. Yet all that can be said is that both of these non-Kantian views are practically, if not logically, bound to follow where more is not made of *noumena* than is made in Kant's *First Critique*.

We plead guilty of not giving the whole Kant—the Kant of the three *Critiques*. But we have given a faithful statement of his epistemology, as giving the reasoned basis of scientific gnosticism and theological agnosticism.

Scientific agnosticism is empirical gnosticism. Neo-Kantianism gives it its philosophical creed. There are no other realities than those of sensuous things and sensuous experience. There is no knowledge of non sensuous things because there are no such things. *Cultivon notre jardins.*

Theological agnosticism, at the opposite pole, reverts to Kant's unknowableness of noumena, and while maintaining the reality of God, of an externe, transcendent, deistic type, denies the capacity of human knowing to comprehend or even to apprehend him, in the interest of a mechanical sort of revelation.

This has filtered down from Kant's doctrine, through Hamilton and Mansel, on the theological side, and through Ritschlianism and pragmatism on the religious side. The first maintains that reason cannot be the source of the knowledge of God. It holds, in an abstract and untrue form, the truth that all knowledge of God must be revealed by God—that man has no organ for finding a hidden God. The others hold that not reason, but the heart, or the feelings, or man's subjective needs are the organs for the apprehension of the Divine—supplanting *knowledge-judgments* by *worth-judgments* or to use Professor James' expression, by "the cash-value" of any beliefs. In both forms, as in Kant's Deism, we have only an extra-mundane Deity beyond the limits of experience.

In no form of Kantianism is there any conception of the Divine immanence. Things in themselves, noumena, are strictly transcendent of experience. They are not the kernel, the essence of phenomena. Whatever reality he attributed to them was such as had no influence on the course of nature or on human experience as we know it. Necessary as the ground of the possibility of this experience or nature, we can readily dismiss them as absolutely extra-mundane. "In all practical questions we can treat phenomena as objects in themselves, without troubling ourselves about the original ground of their possibility." That is the standpoint of agnostic neo-Kantianism, which differs but little from Comte's view. Let us confine, they say, our study to phenomena, the only realities there are for us. The course of the world goes and will go on forever all the same, whether or not there are transcendent noumena or non-sensuous realities. They never enter into experience, and experience is all that we have. Let us stick to it, as stick to it we must.

Of course it is possible to controvert neo-Kantianism from Kant's own *Critique*. It is easy to show that the whole Kant, even Kant of

⁴ Max Müller's translation, p. 340 and 708.

only the *First Critique*, maintained the necessity for presupposing the transcendent *thing in itself*, as the super-sensible substratum of our sensibility and of the whole of our knowing reason; the hidden ground of all phenomena and of our knowing them; the true correlate of all our ideas. But we are to treat fully of neo-Kantianism in a future lecture. Here it need only be remarked that either more must be made of this noumenal factor than is done in the *Critique* itself, or it should be banished from the scene. The neo-Kantians do the latter. But Jacobi well remarked that while an entrance of Kant's philosophy into itself is impossible without this factor, "it is equally impossible to abide by the philosophy, if such objects be presupposed."⁶ That is to say, that more must be made of the *Thing in itself* and of the *Transcendental Ego of Apperception*, than is done in the *Critique*. And this is what was done in the further development of philosophy by Fichte, Schelling and Hegel. Their systems are critical of the inconsistencies of Kant's *Critique* and at the same time developments of it in a way that neo-Kantianism is not. So for a full criticism of the negative side of Kant and of the inconsistencies of his *First Critique*, we need only turn to these latter systems. This we shall do later on.

As subserving our present purpose, we may turn to an examination of the neo-Kantian interpretation of the *Critique*, as this represents its *negative side*—negative, that is, as concerns super-sensuous realities, carrying its agnosticism boldly and frankly to its fullest limit.

Before making this examination of neo-Kantianism we may, however, put in a few words our criticism of Kant's agnostic epistemology. He affirms knowledge, but not knowledge of realities, but only of appearances which are in no way the appearances of realities. He affirms realities—things in themselves, but denies knowledge of them. As we have seen in our chapter on epistemology, the true correlate of every act of knowing is a fact or reality or some grade of it. The act of judgment is essentially an act of affirming reality. The negative judgment only denies something to be real by virtue of its implicit affirmation of some contradicting reality. Thus Kant might, and in places does, as his system requires, deny reality to phenomena by maintaining the reality of noumena. But he no less affirms reality and actuality of these phenomena and positively restricts the application of these categories to aught else than sensuous phenomena and does this by denying reality to all non-sensuous Xs.

Our criticism here may be simply with his term *knowledge*. He should (1) either increase the extension of the term or decrease its intension. He should extend its grasp over the realm of the non-sensuous which he holds in some other way. Practically, for Kant throughout his life, God and soul were more real than sensuous phe-

⁶ Jacobi's *Werke*, 2 Bd., 303.

nomena. But he denies to faith and the practical and teleological judgments by means of which we are put into relation to them, the character of *knowledge*.

"We have *but* faith; we cannot know,
For knowledge is of things we see."

It is true that Tennyson's "but" badly represents Kant's view, which is that we have faith and the moral sense as something far higher than knowledge. He would put it rather:

We have *but* knowledge.

We should increase the *extension* of the term knowledge, making it applicable to all forms of human *experience*.

The root of Kant's agnosticism is found in his limiting the term experience to sense phenomena worked up by the categories. That is, as we have seen, in his transcendental deduction of the categories, he not only limits knowledge to these forms but he limits their application to sense-data. "The *ideas of reason*" (God, cosmos and soul) transcend sensuous data. God and the soul cannot be known because there are no sensuous data to which they can be applied. Then by *experience*, in its philosophical sense, he means the total of human knowledge in which sense is worked up by the *a priori* forms of thought. We insist that experience be taken in its wider sense, as the total of human experience—ethical and religious and aesthetical as well as scientific. It is true that Kant in his *Second Critique* does take our moral experience and analyze its presuppositions. Still he resolutely declines to make it a matter of *knowledge*. It is true that he makes it rest upon a faith which he says is higher than knowledge. But after all human intelligence dislikes the invidious distinction. It seeks knowledge, though at bottom all knowledge rests upon faith. But it demands that it have knowledge in spiritual experience as well as in sensuous experience. Knowledge has the primacy for thought, and so declines Kant's restriction to sensuous data. So, too, in his *Third Critique* he shows the necessity for using the teleological judgment, but resolutely denies it to have constitutive function like the causal judgment.

Or as I have said we should decrease its *intension* as used by Kant. That is, we should say that knowing is merely a *subjective activity* applied to sensuous data and thus transform knowledge into an illusion.

But perhaps we can put the criticism in a better form in spite of formal logic's protest. That is, we should do the illogical deed of increasing both the extension and the intension of the term knowledge. We should extend it to cover the whole realm of human experience—sensuous and non-sensuous. But we should also increase its intention,

that is, its quality, attribute *meaning*. We should make it to be knowledge of truth and reality, not of mere appearances. This is the positive side of neo-Kantianism. It re-ifies phenomena. While restricting its extension to them, it makes them *real*, giving its epistemology its true correlate of ontology. But we must not follow it in thus restricting its extension. Sensuous data are real, but God and the soul are also real. But are they alike real? Or are these all separate realms of experience and is our knowledge merely compartmental? Are God and the soul and nature three distinct realms ununified by any organic relations? To ask this latter question is to answer it. For knowledge is necessarily systematic and unitary. Increase the intension and we know truth and reality. Increase the extension and we have three separate realms? No, the very change of intension itself, apart from the nature of knowledge, demands the unity or the correlation of all that is known. One can easily quote passages from the *Critique* showing how Kant practically and oftentimes illogically does all that we ask. He increases the extension. He decreases the intension. He increases both the extension and intension.

But we turn to a difficulty that faces us as soon as we speak of knowledge as being unitary and systematic. I know God and I know a mountain as realities, but how? As separate and unrelated objects for the same grade of knowledge or as the same object for various forms of knowing? The only solution is that of different grades of knowing and corresponding different grades of reality—noumena and phenomena. Noumena that do not appear are unknowable and unreal, and phenomena that are not the appearances or revelations of noumena are not even phenomena. We know phenomena as phenomenical, revelatory of noumena, and we know noumena in their revelatory phenomena. If thought must think, as Kant admits, of an *ens realissimum*, we cannot know it apart from other realities. And if there are other realities we cannot know them apart from God. Leibnitz put the insight into the different grades of knowledge in his distinction between sense and understanding. He held that sense is only a primary and confused form of clear understanding. Clear and distinct understanding reknows or knows in a higher way the same experience that sense knows. The mountain as a separate distinct reality is reality only known by sense or confused understanding. But the mountain as known by clear understanding is known as an organic part of nature and nature itself is finally known as organically related to God. Thus phenomena and noumena must be the same experience, only for different grades of knowing. Noumena, *things in themselves*, are what are ultimately known as real, the real in all phenomena—in the totality of nature.

We know the limitations of Leibnitz' view. We know how it was corrected and fulfilled in the *Encyclopedia* of Hegel. But an exposi-

tion of Hegel's view must be given in a separate chapter. We only say here that the organic view of knowledge in all its extension and intension implies different degrees of knowing the same experience, giving us different grades of reality. There are no abysmal and impossible chasms between God, nature and man—only degrees of knowing. Experience is a unitary totality. Degrees of reality are of grades of knowing.

The presentation of the negative side and of the contradictory elements in the *Critique* is not a pleasant task for one who fully recognizes the mightiness and the epoch-making work of Kant in philosophy. It is a work that no student of philosophy dare fail to give repeated and prolonged study, every re-reading only increasing the admiration of the new "Copernican" turn he gave to philosophy. It will be a much more agreeable task for us to trace the development of the positive and constructive elements of his philosophy into that of absolute idealism—a world view in which God, man, and nature, are organic elements of total experience, and in which organism, system, God is the ground, the immanent reality of the whole of the process of nature and man, while yet transcendent as the eternal, and personal absolute. But we are here doing this unpleasant side of the work, because we wish to show how modern philosophical, theological, scientific and religious agnosticism find their scientific ground in the negative side of Kant's *First Critique*.

"Back to Kant," back to the *First Critique* and to a patient, prolonged study of it must every student of philosophy go who would understand modern idealism, which negates agnosticism by its epistemological ground-principle, that that which knows in us is the same as that which is known; that like is known by like, mind by mind and thus that there is no absolutely unintelligible element in experience or in its ultimate ground. "Back to Kant," too, has been the cry of the "positivists," the empirical realists of the school of modern physical science. This we shall consider in our next lecture on Neo Kantianism.

What Socrates was to Plato and Aristotle and all the lesser forms of Greek philosophy, that Kant is to Fichte, Schelling, Schopenhauer, Von Hartmann, Hegel and all the lesser lights in philosophy since his day. His place among the immortals in philosophy is assured. So far the neo-Kantian cult is correct. No one to-day has a right to have a world-view who has not thoroughly grounded his thought in that of Kant's *Critical Philosophy*. However far he has got below it as the neo-Kantians have, or above it as absolute idealists have, it should at least be *through* it and not *round* it, from Hume to the modern empiricists. Professor James, as the exponent of what he terms *radical empiricism*, after speaking of Kant as a mere *curio*, says: "The true line of philosophical progress lies, in short, as it seems to me, not so much

through Kant as *round* him to a point where we now stand. Philosophy can perfectly well out-flank him and build herself up into adequateness, by prolonging more directly the older English lines."* But Professor James does not say the last word in philosophy. Here he is only lisping the language of babes in knowledge. The fact is that a consistent empiricist or sensationalist should, logically, be speechless. For language and thought both imply common and universal elements and synthetic relations that cannot be found in mere or "radical empiricism."

* *Jour. Phil., Psychol. and Scientific Methods.* Dec. 8, 1904.

THE LIMITATIONS OF LANGUAGE IN THE EXPRESSION OF TRUTH.¹

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All the intelligent utterances of men, as a rule, assume the forms of words. But what are words? They are not reproductions of anything in the mind; they are merely symbols of something there. Moreover, they are symbols which, though used by several men in the same sense, by no means indicate that these men are representing through them the same thought or feeling. For instance, take such a word as "thirst" or "water." A dog, when he wants a drink, will run to and from a pail in which he has been accustomed to see water. He evidently has in mind a vision of this water, and not the word "water." He never uses the word, and, presumably, therefore, does not think of it. So with a child who cannot talk, or a savage whose vocabulary is limited. Grown people who understand language use the word, and, possibly, think of it. But, besides this, they think of something else. Just as clearly as the dog thinks of a pail, a child of a tumbler, or a savage of a river, they may think, according to the place in which each has been accustomed to sate his thirst, of a spring, a pitcher, or a saloon. This is the same as to say that the same general impression may appeal to the mind in the form of a different image, and, if this image were carefully described in language would be expressed to others in a different word. Add to this now the fact that thought in the mind is never at rest; that one thought is always passing into other thoughts; that one image is always connecting itself with other images; and we must conclude that often out of the same psychic impression revealing itself definitely as a single image, different minds may construct, by way of accretion, whole series of imaginative fabrics that in form are different.

Now notice that the first image, and, of course, all the later images, are results of each mind's appropriating for its purpose, objects or conditions that have been perceived in material nature. To each of these images, it may give a name, which name develops into what we term a word. Any one will recognize this who knows about the origin of words. The word *is*, for instance, comes through the German *ist*, the Latin *est*, and the Greek *esti*, from the Sanscrit word *as* indicating the act of breathing; and because whoever breathes exists, it means to *exist*. The Greek word for *spirit* meant originally *breath*; and as the

¹ Extracts from a book in press entitled "The Psychology of Inspiration." Funk-Wagnalls Co.

breath, though unseen, evidently keeps the body alive, spirit came to mean the unseen principle of life—that without which, when it departs, the body dies. So on through large numbers of words till we come to those of modern origin like *understanding*, *uprightness* and *pastime*. It may be said, therefore, that, although the first psychic impression produced on the mind may be spiritual, the moment this impression assumes definite form and becomes an image, either in the mind's conception or as represented in a picturesque word, and still more as this image connects itself with other images, the results become more or less materialized in character. In this form, though occasioned by the spiritual influence representing it, they cannot be said to be spiritual themselves. They are merely illustrations drawn from the material world of something spiritual, which otherwise could not be communicated to us through the agency of eyes or ears. We are not justified, therefore, in claiming that these illustrations contain literal truth. Nor again are we justified in claiming that they contain no truth; or that they are not worthy of the most scrupulous study undertaken in order to ascertain what this truth is.

The principle involved in these statements has come to be virtually recognized by all thinkers. They acknowledge that, at every stage of intellection, a man is forced to use the forms of the material world in order to represent his mental processes. Otherwise they could not be perceived clearly nor understood intelligently even by himself, and much less by others to whom he would communicate them. Take any one of the more important of the emotions that actuate us, and we shall recognize this fact. Take that experience in some of the manifestations of which religious people believe that a man most resembles the Unseen One. Think how love, which is begotten often in a single glance, and is matured in a single thrill, gives vent to its invisible intensity. How infinite in range and in variety are those material forms of earth, air, fire and water which are used by man as figures through which to represent the emotion within him! What extended though sweet tales, what endless repetitions of comparisons from hills and valleys, streams and oceans, flowers and clouds, are made to revolve about that soul which, through their visible agency, endeavors to picture in poetry spiritual conditions and relations which would remain unrevealed but for the possibility of thus indirectly symbolizing them. Nor is it man alone who is thus obliged to use the forms of material nature in order to reveal the workings of his spirit. He himself does this only, as it were, by way of imitation; only because he partakes, as it were, of the nature and therefore of the methods of the Creative Spirit to which all men and all material nature owe their origin. If what has been said be true of the expression of human love, why should not the Great Heart whose calm beating works the pulses of the universe,

express divine love through similar processes evolving infinitely and eternally into forms not ideal and verbal, but real and tangible—in fact, into forms which we term those of nature?

Do we not all, subtly, at least, believe in the two statements just made? Do we not believe that material nature furnishes the representative implements through which man creates language, and that it furnishes also the actual implements through which the creative spirit produces a language speaking, though in a less articulate and distinct way, to our thoughts and emotions? Have not all who can understand this passage of Wordsworth accepted it as virtually true?

"I have learned
To look on nature, not as in the hour
Of thoughtless youth; but hearing oftentimes
The still, sad music of humanity.

. . . . And I have felt
A presence that disturbs me with the joy
Of elevated thoughts; a sense sublime
Of something far more deeply interfused,
Whose dwelling is the light of setting suns,
And the round ocean, and the living air,
And the blue sky, and in the mind of man:
A motion and a spirit, that impels
All thinking things, all objects of all thought,
And rolls through all things."

—Lines composed a few miles above Tintern Abbey.

But now, if all men, as a rule, express themselves by appropriating material forms of nature through which to represent their thoughts, why should not an inspired man do the same? And if the Divine Spirit find expression in the "unwritten word" through material forms, why should not the same, or something in analogy with the same, be used in the methods of expression in the "written word?" Why should not both these questions be answered affirmatively, especially in view of the fact that in the "written word" language must be used, which language is itself necessarily constructed out of these same material forms in order to represent, so as to be seen or heard, that which cannot in itself be seen or heard? This argument from analogy certainly seems approximately rational.

Of course, if this principle can be applied to single words, it can be applied to whole conceptions which series of words represent. In what way, judging from results, do men usually differentiate the influence of religious leaders of the highest class from that of those who are termed fanatics? Is it not by showing that the latter are not "practical." What is meant by this word as thus used? What but that the fanatics do not accommodate their speech and action to existing emergencies, i. e., to surrounding material conditions, to facts as discovered

by investigation, and comprehended within the sphere of what we term *knowledge*? Only as that which takes its rise in the realm of spirit is correlated by a man to that which is in the realm of matter, so as to find expression through it, can he do for all his fellows that which a man of intelligence should do. This is true as applied to him not only as a thinker, but as a teacher of others who should think. No one can cause either himself or his neighbor to apprehend the full import of spiritual conditions whose mind is not able to do, in some degree, as did the Christ when he never spake without a parable (Mark 4: 34), i. e., without indicating a correspondence between spiritual and material conditions. Men cannot fully recognize the religious connection between mercy and salvation, between faith and love, unless they can perceive them illustrated through analogies of the same in secular connections. They cannot fully realize the relations between God and man, unless they can see these relations imaged in the relations between man and man, or, if they be Christians, between the Great Master and man. Indeed, religion cannot become in the highest sense rational and enlightening, unless it be led by certain ideals: and ideals are always earthly vessels with heavenly contents; outlines modelled on the lower world, filled in with light and color from the upper; figures of the actual transfigured by the potential.

Notice, however, that the condition which has been stated—the necessity of expressing spiritual truth in a material form carries with it the necessity of expressing this truth in a limited way. But nothing can be expressed in a limited way that does not fail to express, in some particulars, the whole truth; and, so far as it fails to do this, it cannot fail, at times, to seem at variance with other statements that contain the parts of the truth omitted in it. For instance, in the Bible, God is termed sometimes a sovereign whose actions are limited by only his own will (Dan. 4: 35), and, sometimes a father whose actions are limited by the pity that he has for his children (Ps. 103, 13; Matt. 6: 32); the Christ is termed, sometimes, the only son of God (John 3: 18) and, sometimes, the first born among many brethren (Rom. 8: 29); and Abraham is termed, sometimes, the father of the Israelitish race (Is. 41: 8) and, sometimes, of those who are not members of that race (Rom. 14: 16). Taken as illustrations used to suggest relationships in an unseen spiritual world, through what we can see and know of the relationships of father, son, brother, or children in a material world, these expressions may prove exceedingly helpful; but taken as statements of literal fact they are contradictory; and taken as arguments to prove exact conditions in the spiritual world, they may be very misleading. No better proof of this fact can be afforded than by the many books and sermons written to show that doctrines like that of "election," "imputed righteousness," or "eternal generation" do not involve

the irrational or erroneous conclusions that some have supposed, but have been misunderstood. Of course, they have been misunderstood; but might not a more thorough remedy for the misunderstanding be found by tracing it back to the extreme and erroneous literalism in which it first took rise. In order to show due regard or reverence for spiritual relationships which can only be figured or symbolized through reference to conditions in the material world, it is not necessary to ignore practically, or to deny, the plain statement in the scriptures that "eye hath not seen, nor ear heard, neither have entered into the heart of man, the things which God hath prepared" (I Cor. 2: 9.).

PAUSANIAS: A SECOND CENTURY BAEDEKER.

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Every traveller to European lands carries with him his Baedeker, that indispensable companion which answers all his questions and solves all his problems, telling him where to stop, what to see and how to get from one place to another. It may not be generally known that we have a similar handbook to ancient Greece, which is an indispensable guide for the archaeologist and the traveller, and has been the key which has unlocked the treasures of many an ancient site. This is an age that is intensely interested in the monuments of ancient civilization which are constantly coming to light. We are sometimes told that love for the classics in our universities and colleges is steadily declining. If this be true, it applies chiefly to matters of grammar and to arid philological problems. There is an enthusiastic and ever-growing interest in archaeological discoveries, and in the fascinating life and art of the Greeks and Romans. Hence a second century guide-book to ancient Greece—the most absorbingly interesting of all the lands visited by the archaeologist and the traveller who desires to search into the origins of our civilization and our art—appeals not merely to the Greek scholar and explorer, but to all lovers of art and letters.

The *Description of Greece* by Pausanias, the second century Baedeker, has come down to us in ten books. It has been translated into English with an extensive commentary in six octavo volumes by Mr. J. G. Frazer, formerly Fellow of Trinity College, Cambridge, so that the wealth of information it contains is accessible to all people of culture. When Aldus Manutius wrote the preface to the *editio princeps* of this work, which appeared in 1516, he departed from the usual monotony of prefatory statements to characterize it as an "*opus antiquæ raræque eruditionis thesaurus continens*." The modern reader will not regard this as extravagant praise, for it imparts to us rare information about all the celebrated sites of ancient Greece, when its monuments still retained much of the splendor and freshness of the earlier times.

The *Description of Greece* is a detailed account of the sites ordinarily visited and the objects usually seen by the traveller who desired to make an extensive tour throughout Greece. As the writer is supposed to be coming from Asia Minor across the Aegean Sea to the Greek Mainland, his account begins with Sunium, the promontory of Attica. Thence he proceeds to Athens. Book I is devoted to the description of Athens and Attica. From Attica the traveller journeys southward by way of Megaris to Corinth and the Argolid, described in Book II.

His Peloponnesian tour follows much the same route which travellers of our day usually take, embracing Laconia (Book III), Messenia (Book IV), Elis (Books V, VI), Achaia (Book VII) and Arcadia (Book VIII). Then follows a second tour to the principal cities of Central Greece, starting from Athens in the same manner as modern travellers would journey. Here the writer's chief attention is absorbed by Thebes in Boeotia (Book IX) and by Delphi in the district of Phocis (Book X). The date of the composition of the work is not definitely known, but can be inferred from certain references to historical events in his works. From these it can be safely asserted that the composition of the *Description of Greece* extended over a period of not less than fourteen years (160-174 A. D.) and probably occupied a much longer time; that Book I, known as the *Attica*, was issued first as an independent treatise and a few years elapsed before Pausanias undertook the larger task, and that the rest of the books were written in the order in which they stand.

The regions of Western and Northern Greece are left entirely out of consideration, for countries like Acarnania, Aetolia, Epirus and Thessaly were regarded as semi-barbarous by the cultured Greeks of Athens and Corinth, and played no prominent part in the art and civilization of Hellas. Topographical directions are not always exact; yet by mentioning in order the name of districts, of cities and of monuments in the various countries, Pausanias throws much light on the geography and topography of ancient Greece.

Though the work itself is so voluminous and so universally known, our knowledge of the author is very limited. The book shows that he was an intelligent traveller of the days of Hadrian and the Antonines; its style gives us some insight into his personality, but as to the author's family, birthplace, citizenship and pursuits in life we are left in almost total ignorance. An occasional allusion, however, conveys some intimation. If we inquire, for example, whence he came he gives us a hint in Book V, Chapter 13, "In my country there are still left signs that Pelops and Tantalus once dwelt in it," etc., where it is suggested that his native land was the territory about Mount Sipylus in Lydia, and mention is made in what follows of natural features and monuments pertaining to this region. This statement is strengthened by many passages in which he recurs to the scenery and legends of Lydia. We conclude, therefore, that he was a Lydian by birth; but whether he was a native of Magnesia, the important city at the northern foot of Mount Sipylus, or of Thyatira, or of some less known town, is not to be ascertained. With this limited information as to the personality of our author we must rest content.

That Pausanias has given to the world a work of unique value is manifest to anyone who notes its contents. We have here a rich mine

of antiquarian, mythological, historical and artistic lore, about Athens and the Acropolis; about Mycenae, home of King Agamemnon (and this passage gave rise to Dr. Schliemann's wonderful discoveries); about Olympia, the center of Greek worship and site of the Olympic games; about Delphi, seat of the Delphic oracle, not to speak of the less important places. The very nature of the subject-matter arouses inquiry as to the author's aim in preparing his work. Yet the answer is nowhere clearly given by him. He begins his work without a preface; he concludes without an epilogue. Probably his work was left unfinished and he was given no opportunity to revise it; probably while it served its purpose, the author felt there was no need of explanatory remarks. Hence, the answer to our question is largely a matter of inference; but we can, at any rate, gather from utterances here and there what was the author's general purpose and how his method developed as his grasp of the subject increased.

Thus he tells us in one passage (1. 26. 4) that it was his purpose to describe the whole of Greece as he had the Acropolis. Again after his account of Athens and Attica, he adds (1. 39. 3): "Such are, in my opinion, the most famous of the Athenian traditions and sights: from the mass of materials I have aimed from the outset at selecting the really notable." Later, as a preface to his description of Sparta, he refers to this statement, and outlines his aim and method more definitely (3. 11. 1): "To prevent misconceptions, I stated in my *Attica* that I have not described everything, but only a selection of the most memorable objects. This principle I will repeat before I proceed to describe Sparta. From the outset I aimed at sifting most valuable traditions from out of the mass of insignificant stories which are current among every people. My plan was adopted after mature deliberation and I will not depart from it." From these passages and from a study of the contents of the work it becomes clear that it was the purpose of Pausanias to describe all the most notable objects and to narrate for the benefit of other travellers all the most memorable traditions which were extant at the time of his travels in Greece.

This was a vast undertaking, especially so in the case of Attica, the first country he undertook to describe. Here he was bewildered by an embarrassment of riches before he had arrived at the best method of treating the data at hand. Hence, in Book I the author's method is not so clearly defined as in the later books. Beginning with Book II, he regularly prefaces his account of every important city with an historical sketch and follows strictly the topographical order of description. But in the case of the *Attica* there is no historical introduction whatever; though the topographical order is in the main observed in describing Athens, it is not followed in his treatment of the rest of Attica. At times the course of description is confused, as when he

interrupts his account of the townships to describe the mountains of Attica. Again, he mentions fewer notable objects in proportion to the total number in Athens than he does in any other important centre of Greece, and his descriptions of notable monuments in Athens are shorter than those in the remaining books. The explanation of the defects of the *Attica* is, of course, that the author is finding himself in his new work, and has not altogether arrived at a definite plan. The topographical method followed in the description of Athens reveals the author's purpose in preparing the work. Thus he begins by describing the harbors of Athens and the objects of interest on the roads leading from the harbors to the city. He next enters the principal gate and proceeds by a broad avenue to the Market-place, which he treats in great detail. Thence he traverses the territory east of the Acropolis, known as the City of Hadrian. A description of the southern slope of the Acropolis finally brings him to its principal entrance, and, having entered, he devotes to the objects of interest in the sacred precinct the maximum of attention. He concludes his account of Athens by describing the suburbs of the city. Let us compare this description with the description of Athens in Baedeker's Greece. The writer of this work gives first a historical sketch of the city. He then describes it in several sections: a, From the Royal Palace round the south side of the Acropolis; b, The Acropolis; c, From the Palace through the Town to the Theseum; the Hill of the Nymphs, the Pnyx, and the monument of Philopappus; d, Modern Quarters of the Town; e, Walks near Athens.

These resemblances show that we have in Pausanias the prototype of Baedeker and Murray. The second century was an age of travel, like our own, and many needed systematic direction to help them on their way. The public-house system of the country was poor, but private hospitality, as in the earlier days, made some amends. Accordingly, the description of inns and other accommodations which Dionysus in the *Frogs* of Aristophanes feels to be such a desideratum and which our Murray or Baedeker offers in great detail, is wanting; but in other respects the likeness between the ancient and the modern *cicerone* holds. The work was meant to be primarily a guide-book for the generally frequented parts of Hellas, with special reference to works of art, like the modern Bueckhardt. To gratify the intellectual curiosity of his readers, Pausanias fills his volume with mythical, antiquarian, and historical lore, and he doubtless felt that his work would be serviceable to the historian as well as to the traveller. Yet his main purpose was, without doubt, to provide a guide-book for visitors to the historic sites of Greece.

The literary style displayed in the book before us is influenced partly by the nature of the subject-matter, partly by the character of the author

as reflected in his work. Pausanias is revealed as an unimaginative man, but one deeply interested in antiquarian lore, who set out on his travels with the purpose of "doing" Greece and of giving others the benefit of his reading and observation, and who kept at it with heroic persistence. He permitted no curious legend to escape him, and gathered information from every source. He carefully studied his predecessors in historical prose, especially Thucydides and Herodotus, and laboriously sought to cultivate a good style. But he falls hopelessly short of the vigorous expression of the former, and the sweetness and lucidity of the latter. There is a sense of strain about his style. As Frazer so well puts it, "The sentences are devoid of rhythm and harmony. They do not march, but hobble and shamble and shuffle along. At the end of one of them the reader is not let down easily by a graceful cadence, a dying fall; he is tripped up suddenly and left sprawling, till he can pull himself together, take breath, and grapple with the next. It is a loose, clumsy, ram-shackle style, without ease or grace or elegance of any sort."¹ Yet one would never imagine this who confines his reading to the elegant, fluid prose of Frazer's translation.

In modern times Pausanias's trustworthiness and literary independence have been vigorously attacked by eminent German scholars. Scalegger, for example, characterized him as being "*omnium Graeculorum mendacissimum*." These criticisms find expression chiefly in the work of Kalkmann (*Pausanias der Peneget*, Berlin, 1886), who argues that Pausanias had travelled and seen very little in Greece, but had compiled the bulk of his work from the manuals of other writers, and had added a few hasty jottings of his own to give his descriptions a convincing atmosphere. The charges of Kalkmann, however, which were a severe impeachment of Pausanias's moral character, as well as of his literary ability, have been successfully refuted by Gurlitt (*Ueber Pausanias*, Graz, 1890), by Heberdey (*Die Reisen des Pausanias in Griechenland*, Vienna, 1894), and by Frazer in the introduction to his translation of Pausanias.

In regard to the historical passages, Frazer shows that Pausanias drew his accounts of the mythical and heroic ages largely from the poets; that Herodotus is the historian most frequently cited by him; and that Thucydides and Xenophon were often consulted; that he also refers to numerous other historians, and cites local histories again and again; and that he made extensive use of inscriptions, consulted writers on art and got information from local guides.

Regarding next the descriptive or topographical passages, Frazer considers whether Pausanias derived his knowledge from observation, from books, or from both. The author himself gives no full or direct answer to these questions. He neither professes to have seen every-

¹ See Frazer, *Pausanias's Description of Greece*, vol. I, Introduction, p. lxxix.

thing he describes, nor does he acknowledge having borrowed any of his descriptions from previous writers, whom he barely alludes to and never mentions by name. Yet he affirms that he saw personally certain things he describes; and to have seen certain things implies that he saw others. There are descriptions which Pausanias may have taken from books, but there is no description extant so like in form and substance to what Pausanias has written that one can say he copied from it. Frazer considers in detail a number of passages which, others have thought, bear traces of having been derived either wholly or in part from written documents rather than from personal observation, and concludes that in none are the indications so clear as to amount to a proof of borrowing. Frazer discusses in considerable detail the predecessors whom Pausanias ought to have consulted. He concludes that there is no support whatever for the theory that Pausanias copied outright, and we are not even justified in supposing that he was acquainted with the writings of his learned predecessors.

Another theory of Kalkmann's that obtained some vogue was that our author did not describe Greece as it was in his own time, but as it was a century or two earlier, when his alleged sources were composed. This theory is more susceptible of verification, namely, by proving that certain things Pausanias speaks of as existing had ceased to exist before his time. Kalkmann, for example, thus attacks the description of the Piræus. It had been burnt in 86 B. C. and was in a ruined condition when seen by Strabo; how then could Pausanias's account of its temples and colonnades apply to his own time? Frazer, in reply, shows what great changes were possible in two hundred years, and how the Piræus had regained prosperity under beneficent Roman emperors. He also gives numerous proofs, from existing monuments and otherwise, that Pausanias described Greece as it was in his own age.

We may say, then, that at present a conservatively just view has succeeded the bitter outcry against our author's alleged untrustworthiness. Pausanias cannot be regarded as an independent creative spirit, originating a great work for the benefit of mankind. He is rather a true child of his time, a plodding collector, somewhat superficial and credulous, with a propensity for the archaic and the mystical, but withal an intelligent and inquisitive traveller, who rambled through land and city and carefully noted what to him appeared worth seeing and recording. The extant monuments prove that his description of Greece is founded primarily on personal observation. Yet he did not neglect his predecessors and got together historical and mythological material out of handbooks. He also consulted, as did Herodotus, local priests and guides in his eager search for information. As a result, he has handed down to modern times a readable and instructive description of travel, presenting a fairly coherent picture of ancient Greece, and a work which is indispensable to the traveller and investigator.

We cannot better conclude this brief sketch of the work of Pausanias than by quoting the appreciation of Frazer:¹ "Without him the ruins of Greece would for the most part be a labyrinth without a clue, a riddle without an answer. His book furnishes the clue to the labyrinth, the answer to many riddles. It will be read and studied so long as ancient Greece shall continue to engage the attention and awaken the interest of mankind; and if it is allowable to forecast the results of research in the future from those of research in the past we may venture to predict that, while they will correct the descriptions of Pausanias on some minor points, they will confirm them on many more, and will bring to light nothing to shake the confidence of reasonable and fair-minded men in his honor and good faith."²

¹ Frazer, vol. I, p. xcvi.

² For a more detailed and technical treatment of Pausanias's *Description of Greece*, the reader is referred to the author's edition of *The Antica of Pausanias*, shortly to appear from the press of Ginn and Company.

NOTES ON SOME SEVENTEENTH-CENTURY USES
OF WORDS IN FRENCH.By GEORGE N. HENNING, A.M.,
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Autre. The use of *un autre*, feminine, is common in the early editions of Corneille. It occurs also in Racine's *Andromaque*, 1378. In Corneille's *Veuve*, 1733, is a curious instance of a masculine participle (the rhyme-word) agreeing with feminine *un autre*: "Mais aujourd'hui qu'un autre [femme] en sa place reçu." There are also several cases of pronominal *l'un*, fem., in connection with *l'autre*, in Corneille. One is in *Mérite*, 908-909:

"Je ne sais plus qui croire ou d'elle ou de sa plume:
L'un et l'autre en effet n'ont rien que de léger;"

Another is in *la Galerie du Palais*, 1580-1581 var.:

"J'aurai de vous ma grâce, ou la mort de ma main.
Choisissez, l'un ou l'autre achèvera mes peines;"

Further examples are *la Place Royale*, 799 var. and *Médée*, 1230 var. In all these cases *l'un* is followed by *et* or *ou*, and was doubtless pronounced like *une*.

Déguiser. The usual meaning of *déguiser* in the seventeenth century, was, as now, "disguise." But in a number of passages in Corneille, Molière and Racine, the meaning seems rather "conceal" simply, without the additional idea of disguising. The two meanings are so close that it is hard to differentiate, but in the following passages "conceal" would seem to make rather better sense:

"J'ose me déguiser jusqu'à son parricide."—*Rodogune*, 720.

"Je ne puis déguiser que j'ai peine à vous suivre."—*Polyeucte*, 674.

"L'image de l'affront lui revient, et sa fuite
Tâche à me déguiser le trouble qui l'agite."—*Dépit amoureux*, 897.

"et j'aurais lieu de plainte, Si . . . Vous alliez me trahir, et me déguiser rien."—*Misanthrope*, 303. "Mais, s'il faut ne te rien déguiser, Mon innocence enfin commence à me peser."—*Andromaque*, 771.

Ennui. In *Tartuffe*, 503-504, occur the lines:

"Ferez-vous possesseur, sans quelque peu d'ennui,
D'une fille comme elle un homme comme lui?"

No edition of the play that I have seen gives the meaning "anxiety" here, though it seems absolutely required by the context, i. e., by Dorine's plain-spoken language in 505 et seq.: "Et ne devez-vous pas . . . de cette union prévoir les conséquences?" etc. This meaning is

given in Nicot's *Thresor*, and is not uncommon in Corneille; e. g. *Cid*, 448, *Horace*, 834, *Polyeucte*, 23.

Ombrage. In several passages in Corneille and Molière, *ombrage* seems to have the meaning "jealousy" (given in Cotgrave), in the usual modern sense of the word, rather than the more ordinary "suspicion" or "offence." Such are: "Ton esprit amoureux n'aura-t-il point d'ombrage?"—*Cid*, 498. "Quoi! vous me soupçonnez déjà de quelque ombrage?"—*Polyeucte*, 609. "Madame, Alcippe vient; il aura de l'ombrage."—*Menteur*, 185. "ce fils qui déjà lui donne tant d'ombrage."—*Nicomède*, 1288. "témoigner de l'ombrage, C'est jouer en amour un mauvais personnage."—*Dépit amoureux*, 125. "Qu'injustement de lui vous prenez de l'ombrage!"—*Misanthrope*, 489.

The "Norman Rhyme." In Le Boulanger de Chalussay's *Élomire Hypocondre*, Act III, scene II, the précieuse Alphée, who everywhere substitutes *l* for *r*, says *fleurcel*, *admilél*, etc. This would indicate that at that time, 1670, final *r* was pronounced in *-er* infinitives, for if it had been silent there would have been no point in substituting the *l* in print. This may throw a little light on the vexed question of the "Norman rhyme."

NOTES ON THE STYLE OF SENECA THE PHILOSOPHER.*

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The prominent position of the younger Seneca in the history of Latin literature has been frequently attested. He was "the most brilliant figure" of his time, and "a faithful image of his period," who "purposely wrote in harmony with the prevailing taste and successfully courted the applause of his contemporaries."¹ By developing the tendencies started by Ovid he became the creator of a new school of rhetoric;² and a thorough examination of his language is necessary before any certain judgment can be passed upon Silver Latinity, without an understanding of which no complete history of the Latin language is possible.³ Few of the Roman writers attained greater brilliancy of style than he, not only because of the sententious brevity by which he intentionally checked the flowing torrent of Ciceronian eloquence, and the careful attention which he paid to rhythm and the collocation of words, but also because of the poetic coloring which he gave even to his prose, as seen especially in the boldness of his metaphors.⁴ He was generally regarded in later times as the literary representative of the early empire, being better known in the Middle Ages than even his great rival Cicero; and became the object of more hostile criticism on the one hand and enthusiastic admiration on the other than any other author of antiquity. In the bitter contest which was waged in the days of Trajan between the Modern party in literature and the Reactionaries, his name and that of Cicero were the rallying-cries of the opposite schools, and he and Tacitus are to be considered the best representatives of the "modern style."⁵ Indeed, Tacitus himself, like Pliny and Juvenal, was an imitator of Seneca;⁶ while, on the other hand, the inimical attitude of the professional rhetoricians is shown by Quint. 10, 1, 126 f., Fronto, p. 155 f. (Naber) and Gell. N. A. 12, 2, 1 f.

We should have expected that the style of an author of such prominence would long ago have received a careful and exhaustive

* Abstract of a dissertation submitted to the Board of University Studies of the Johns Hopkins University in conformity with the requirements for the degree of Doctor of Philosophy, to be published in full hereafter.

¹ Teuffel-Warr, "History of Rom. Lit.," §287 ff.

² H. M. Kingery, "The Modos of Seneca," p. 19.

³ H. Krieger, "Observationes Annaeanae," p. 5.

⁴ M. Zimmermann, "De Tacito Senecae philosophi imitatore," p. 2.

⁵ E. Norden, "Die antike Kunstprosa," p. 306-312.

⁶ A. Gercke, "Seneca-Studien," p. 133 ff.; cf. Zimmermann, op. cit.

investigation, but comparatively little attention has been given to it. Since H. Rieger's dissertation on Seneca's use of the causal particles, published in 1889, the only important contributions have been by G. Reinecke (1890), on the conjunctions; J. Jöhring (1894), on *ut, ne, quin*, and *quomodo*; J. Hammelrath (1895), on the tenses; F. Recl (1895), on the preposition *in*; H. Weber (1895), "De Senecae philosophi dicendi genere Bionico"; and R. B. Steele (1902), on chiasmus in epistolary Latin. A large part of the field, therefore, still remains untouched, especially in the very region which, in an author like Seneca, ought to be most inviting, as well as most productive, namely, his rhetorical peculiarities. The present article is an attempt to add something to our knowledge along these lines, and, as it appeared best to undertake a somewhat thorough investigation of a limited portion of the subject rather than a more superficial consideration of the whole, it is confined to Seneca's use of metaphor and comparison in the Letters to Lucilius.

The Letters are selected for this purpose because they are generally recognized as the most distinctly characteristic literary work of Seneca and as "giving the fullest reflection of the writer's idiosyncrasy."¹

The importance of a study of metaphor and the kindred figure, simile or comparison, has been often emphasized, even as far back as Aristotle (cf. Poetics, chap. 22); and the great value which a complete index of Latin metaphors would have for a student of that language is mentioned on p. 504 of Nagelsbach-Müller's "Lateinische Stilistik." Moreover, a list of these figures as they are found in the works of an individual author throws a great deal of light upon his own range of thought and creative talent, and upon the civilization of the period in which he lived.² Accordingly, the main object of the present investigation is to show how extensively Seneca made use of metaphors and comparisons, the spheres from which he derived them, and the way in which he handled them; while at the same time it seeks to make a collection of examples which may contribute toward our understanding of Latin figurative language in general, and of Silver Latinity in particular. For this reason "metaphor" is interpreted rather broadly, so as to include some cases which strictly belong under the head of metonymy, as well as many tropical expressions which, though somewhat trite and commonplace, could not be omitted from any comparative study of Latin phraseology and style; and the term "comparison" has been used instead of "simile," so as to admit instances of what G. O. Berg, in his dissertation on "Metaphor and Comparison in the Dialogues of Plato" calls "didactic comparisons."

¹ Teuffel-Warr, op. cit. §299.

² Cf. Baeker, "Die Metaphern in den Satiren des Horaz," p. 1; J. Franks, "De Tib. Silli Ital. Pencilorum tropis," p. 5; O. Schmidt, "Metapher u. Gleichnis in den Schriften Lukians," p. 1; H. L. Wilson, "The Metaphor in the Epic Poems of P. P. Statius," p. 1.

The number of examples resulting from this plan is so large that a systematic arrangement of the material becomes essential. Of the various methods that have been employed in the classification of metaphors, the one best suited for our present purpose is that used by H. Blummer in his "Studien zur Geschichte der Metapher im griechischen" (Leipzig, 1890), and it is accordingly adopted here, with such minor changes as the character of the material demands. The general divisions are as follows: I. Man, (A) Soul, Mind, Emotions, (B) The Body and its Conditions, (C) Shelter and Clothing, (D) Family and Daily Life, (E) Religion and Mythology, (F) Farming, Hunting, Fishing, (G) Arts and Trades, (H) Commerce and Travel, (I) Warfare, (J) Politics and Law; II. The Realm of Nature, (A) The Animal Kingdom, (B) The Vegetable Kingdom, (C) The Mineral Kingdom, (D) The Elements, Weather, (E) Land and Sea; III. General Notions, (A) Properties of Material Objects, (B) Words indicating General Actions.

A study of the examples, including over five thousand metaphors and between three and four hundred comparisons, arranged under these heads and their appropriate subdivisions, leads to the following conclusions:

The range of Seneca's tropes and illustrations is very large, covering, with a few exceptions, practically the entire field of the private and public life of the ordinary Roman, and demonstrating the "multa rerum cognitio" which is conceded to him by Quintilian (Inst. Or. 10, 1, 128). His favorite sources for figurative expressions are the human body and its affections, especially diseases and their cure (Seneca himself was always more or less of an invalid);⁹ the relations of master and slave; the legal and financial spheres; warfare and conflict; and the various phases of travel by land and sea. Not only is the total of metaphors and comparisons a large one, but the great number and variety of the individual expressions used is particularly noteworthy.

The great majority of the examples are drawn from the language of daily life (the proverbial character of many of them being manifest), and from the commonplaces of the teachers of rhetoric and philosophy. This was to be expected of an avowed Stoic, and the son of the author of the "Controversiae" and "Suasoriae," the pupil of Sotion, and the enthusiastic admirer of Fabianus. He himself does not hesitate to indicate, in a number of instances, the author of the figure which he employs. The "popular" element in his style, which is criticized by Gellius (N. A. 12, 2, 1), appears in this sphere, as elsewhere; though here it may well be regarded as a merit rather than a fault. Seneca's

⁹ Cf. K. F. H. Marx, "Uebersichtliche Anordnung der die Medizin betreffenden Aussprüche des Philosophen L. Ann. Seneca."

claim to distinction as regards the use of metaphor and simile is not on the ground of originality in their invention, but is based upon his skill in the application and variation of those already familiar, and the vividness and detail of some of the descriptions with which he accompanies them. The latter characteristic is seen in such passages as Ep. 13, 2-3: "*Non potest athleta magnos spiritus ad certamen adferre, qui numquam sugellatus est: ille, qui sanguinem suum vidit, cuius dentes crepuere sub pugno, ille, qui subplantatus adversarium toto tulit corpore nec proiecit animum proiectus, qui quotiens cecidit, contumacior resurrexit, cum magna spe descendit ad pugnam. Ergo, ut similitudinem istam prosequar, sæpe iam fortuna supra te fuit, nec tamen tradidisti te, sed subsiluisti et acrior constitisti. Multum enim adicit sibi virtus incessita*"; Ep. 40, 6-9: "*Non vacat mihi verba dubie cadentia connectari et vafrum in illis meam experiri. 'Adspice qui coeant populi, quæ menia elusis ferrum acuunt portis.' Magno mihi animo strepitus iste belli circumsonantis exaudiendus est. Demens omnibus merito viderer, si cum saxa in munimentum murorum senes feminaeque congererent, cum iuventus intra portas armata signum eruptionis expectaret aut posceret, cum hostilia in portis tela vibrarent et ipsum solum suffusionibus et cuniculis tremeret, sederem otiosus et eiusmodi questionculas ponens: 'quod non perdidisti, habes. Cornua autem non perdidisti: cornua ergo habes' aliaque ad exemplum huius acutæ delirationis concinnata. Atqui æque licet tibi demens videar, si istis nunc inpendero operam: et nunc obsidear. Tunc tamen periculum mihi obsessio externum immineret, murus me ab hoste secerneret: nunc mortifera mecum sunt" (cf. Ep. 82, 4-5); Ep. 70, 2-4, where life is compared to a voyage, and Ep. 107, 2-3, where it is compared to a journey; and Ep. 100, 5-6, where the style of Fabianus is compared to a well-proportioned house.*

We gain an important clue to our author's method and motive in using these figures, from his own words in Ep. 59, 6 (commenting upon a letter from Lucilius): "*Invenio tamen translationes verborum ut non temerarias ita quæ periculum sui fecerint. Invenio imagines, quibus si quis nos uti vetat et poetis illas solis iudicat esse concessas, neminem mihi videtur ex antiquis legisse, apud quos nondum captabatur plausibilis oratio: illi, qui simpliciter et demonstrandæ rei causa eloquebantur, parabolis referti sunt, quas existimo necessarias, non ex eadem causa qua poetis, sed ut inbecillitatis nostræ adminicula sint, ut et dicentem et audientem in rem præsentem adducant*"; and especially Ep. 75, 2: "*Si fieri posset, quid sentiam, ostendere quam loqui mallet.*" It is his desire to visualize, as it were, the ethical and moral principles which he advocates, and to emphasize and perfect the conception of them by presenting them from as many different angles as possible, which leads him to make such large use of illustrative figures. Sometimes, indeed, this desire, in connection with the comparatively limited circle of topics

which he treats, causes him to overdo the matter in a way which justifies Fronto's criticism of him (p. 155 f., Naber) as "*redundantem hominem*" whose figures "*eandem sententiam miliens alio atque alio amictu indutam referunt.*" Yet, on the whole, there is sufficient variety to prevent monotony, for we do not often find the same figure applied again to a given subject in the same way; and sufficient good taste to prevent his falling into the faults of "*verba prisca aut ficta . . . et translationes inprobas figurasque dicendi*" which he criticizes in Ep. 108, 35. In length, his tropes and similes vary from single words to passages extending through several sections of the text, as Ep. 81, 17-20.

Finally, we may mention the following characteristics:

(1) Massing of several metaphors or comparisons on the same theme. Examples of this are: Ep. 1, 1 *tempus . . . auferebatur . . . subripiēbatur . . . excidebat, collige et serva . . . tempora eripiuntur . . . subducuntur . . . effluunt*; Ep. 2, 3 (discursive reading compared to travel, food, medicine, curing a wound, a plant); Ep. 16, 3 *philosophia . . . format et fabricat . . . disponit . . . regit . . . demonstrat . . . sedet ad gubernaculum . . . derigit cursum*; Ep. 33, 7-10, where a series of figures is employed to support the proposition that the Epicurean writings are not superior to those of the Stoics because of the fact that they are better adapted for quotation; Ep. 66, 43, where the idea of death is variously expressed by *decessit, mors . . . præcidit . . . interruptit, solutus est, continuata mors somno est, extinxit, desinunt*; Ep. 71, 3 (the necessity of having a definite plan in life illustrated by the painter, the archer, and the sailor); Ep. 71, 12-14 (the alteration in the character of the Roman State compared to the changes of the earth, the sky, heavenly bodies, the universe, age, the human race); Ep. 76, 8-9 (man compared to a vine, a deer, beasts of burden, a dog, lion, peacock, horse), cf. Ep. 79, 8-9 and 124, 10-11; Ep. 91, 9, where a number of different metaphorical phrases are applied to the destruction of cities; Ep. 97, 10-11 (the art of living contrasted with that of the pilot, the physician, the orator, and the advocate).

(2) Combination of metaphor and simile, the one leading to the other, or interwoven. Examples of this are too numerous for us to do more, in this place, than mention, by way of illustration, Ep. 66, 26-27, as a case of metaphor following simile; and Ep. 80, 7-8, where a simile is introduced by a metaphor (*hic humana vitæ mimus*).

(3) Revitalizing of trite metaphors, as: Ep. 15, 9 *cæca cupiditas . . . præcipitat*; Ep. 34, 2 *ego quom vidissem indolem tuam, inieci manum, exhortatus sum, addidi stimulos nec lente ire passus sum, sed subinde incitavi: et nunc idem facio, sed iam currentem hortor*; Ep. 42, 5 *meministi, cum quendam adfirmare esse in tua potestate dixisse me volaticum esse ac levem et te non pedem eius tenere, sed pennam. Mentitus sum? Pluma tenebatur, quam remisit et fugit*; Ep. 45, 5

nectimus nodos et ambiguum significationem verbis inligamus ac deinde dissolvimus; Ep. 58, 1 verborum . . . paupertas, immo egestas; Ep. 71, 25-26 omnia rerum adversarum onera rigida cervice sustollat . . . succidere . . . incurvari et succumbere . . . stat rectus sub quolibet pondere . . . ferenda . . . cadere . . . cecidisse . . . vires . . . oneri ferendo, cf. Ep. 76, 30, and 78, 13 and 17; Ep. 79, 18 tenue est mendacium: perlucet, si diligenter inspexeris: Ep. 84, 13 confragosa in fastigium dignitatis via; Ep. 94, 50-51 consecuti . . . pervenitur . . . proficenti . . . via . . . perveniat . . . regi debet; Ep. 100, 10 (oratio) non est violenta nec torrens, quamvis effusa sit; non est perspicua, sed pura; Ep. 109, 16 videre . . . excæcat . . . dispectum . . . vident, cf. Ep. 102, 28.

LATE SEVENTEENTH CENTURY COMEDY.

By DEWITT C. CROISSANT, A.B.,
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Not such a long time past it was customary for all romanticism-mad critics to decry Pope as in no sense a poet. The changed attitude towards him indicates that a reaction is setting in, and that possibly we are becoming less romantic in our literary taste. How far this appreciation of the neo-classical school will go it is impossible to predict. But that we should in time appreciate the minor exponents of neo-classicism would be no more wonderful than the appreciation of Elizabethan romanticism which was a mark of the last century.

The comedy of the latter part of the seventeenth century is one phase of this neo-classical movement that it is yet the fashion to condemn. Many school histories continue to treat with silence all of the period so far as the dramatists are concerned, others content themselves with a brief mention of three or four important names, while many of the more serious books have nothing but a sweeping denunciation. It is to be hoped that some competent and sympathetic critic may in time enter the field, for the drama in England from 1660 to the present has received no attention proportionate to its interest and value, and within this field the comedy most repays study.

The comedy of manners of the later seventeenth century is a direct development of the comedy of "humours" of the early seventeenth century, influenced by French classical comedy and the Spanish comedy of intrigue. The tradition of Jonson is seen particularly in Shadwell, while the Beaumont and Fletcher comedy likewise appears in a very large portion of the dramatic writers. In this later manifestation the emphasis is transferred from human nature to dress and manners, though the characters of course continue to be the embodiment of a single trait. On the other hand, in the attempt to carry out the French interpretation of Aristotle, and in the polish and emphasis of the qualities of style and dialogue, the comedy owes much to Molière and his school.

Several distinct stages may be distinguished. First there is the period of development in which the Jonsonian type is represented by Shadwell and the French type by Etherege, of the latter of whom Gosse says that he "virtually founded English comedy, as it was successively understood by Congreve, Goldsmith and Sheridan." Shadwell is a lesser—much lesser—Jonson. He resembles his master in his portrayal of extravagance of character, in the lack of plot unity, and in the same general method of having two sets of characters, characterized by Miss Woodbridge as the dupers and the duped. But he is interesting

chiefly as showing the persistence of the Jonsonian technique into this period.

The height is reached in Dryden, Wycherly, Congreve, Vanbrugh and Farquhar, who are the only writers known to the general reader. Dryden, while not original in his plots, is not worthy the almost universal condemnation he receives from the critics. In Wycherly there is true satire, satire almost Swiftian in its intensity. Congreve reaches the highest perfection. His style is almost perfect, his wit is supreme in English literature within its field, though as George Meredith says, "A plot was an after-thought with Congreve." The delicacy and fineness of his points make him a library rather than a stage dramatist. It is to Congreve that Lamb's defense particularly applies, and with respect to Congreve one is inclined to admit that the plea is valid. But in Vanbrugh we begin to leave this Utopian fairyland, for Vanbrugh is an observer, not a poet. In Farquhar the moral standard appears still more, and love ceases to be mere sensuality.

The transition to Sheridan and Goldsmith is represented by Cibber and Steele. In this sentimental comedy we find a moral attached to each play, often a rather maudlin moral, appearing after four acts which are not much higher ethically than those of Vanbrugh or Wycherly. This change may be illustrated by a comparison of this from Etherege: "Your nephew ought to conceal it (his marriage) for a time, Madam, since marriage has lost its good name; prudent men seldom expose their own reputations till 'tis convenient to justify their wives," with Steele's sentiment that "wedlock is hell if at least one side does not love as it would be heaven if both did." But this lachrymose comedy led to the taking wit and the kindly attitude of Sheridan and Goldsmith, in which we again find ourselves in the world of reality, without the four acts among the "chaotic" people.

The attitude of writers toward the morality of the comedies is interesting. Lamb's defense in his essay, "On the artificial comedy of the last century," is the classic:

"We have been spoiled with . . . the . . . drama of common life; where the moral point is everything; where, instead of the fictitious half-believed personages of the stage, (the phantoms of old comedy,) we recognize ourselves, our brothers, aunts, kinsfolk, allies, patrons, enemies—the same as in life . . .

" . . . I do not know how it is with others, but I feel the better always from the perusal of one of Congreve's—nay, why should I not add even of Wycherly's—comedies. I am the gayer at least for it; and I could never connect those sports of a witty fancy in any shape with any result to be drawn from them to imitation in real life. They are a world of themselves almost as much as fairyland. . . . But in its own world do we feel the creature is so very bad? The Fainalls and the Mirabels, the Dormants and the Lady Touchwoods, in their own sphere, do not offend my moral sense; in fact they do not appeal to it at all. They seem engaged in their proper element. They break

through no laws, or conscientious restraints. They know of none. They have got out of Christendom into the land—what shall we call it?—of cuckoldry—the Utopia of gallantry where pleasure is duty, and the manners perfect freedom. It is altogether a speculative scene of things, which has no relation whatever to the world that is. . . . He (Congreve) has spread a privation of moral light . . . over his creatures; and his shadows flit before you without distinction or preference. Had he introduced a good character, a single gush of moral feeling, a revulsion of the judgment to actual life and actual duties, the impertinent Goshen would have only lighted to the discovery of deformities, which now are none, because we think them none.

" . . . When we are among them (the characters of Congreve and Wycherly), we are amongst a chaotic people. We are not to judge them by our usages. No reverend institutions are insulted by their proceedings, for they have none among them. No peace of families is violated, for no family ties exist among them. No purity of the marriage bed is stained, for none is supposed to have a being. . . . There is neither right nor wrong, gratitude or its opposite, claim or duty, paternity or sonship. . . .

"The whole is a passing pageant. . . . But, like Don Quixote, we take part against the puppets, and quite as impertinently. . . . we would indict our very dreams."

This was replied to by Macauley in his review of Leigh Hunt's edition of the Dramatic Works of Wychery, Congreve, Vanbrugh and Farquhar:

"In the name of art, as well as in the name of virtue, we protest against the principle that the world of pure comedy is one into which no moral enters. If comedy be an imitation, under whatever conventions, of real life, how is it possible that it can have no reference to the great rule which directs life, and to feelings which are called forth by every incident of life? If what Mr. Charles Lamb says were correct, the inference would be that these dramatists did not in the least understand the very first principles of their craft. Pure landscape-painting into which no light or shade enters, pure portrait-painting into which no expression enters, are phrases less at variance with sound criticism than pure comedy in which no moral enters.

"But it is not the fact that the world of these dramatists is a world into which no moral enters. . . . The heroes and heroines, too, have a moral code of their own, an exceedingly bad one. . . . It is . . . a code actually received and obeyed by great numbers of people. We need not go to Utopia or Farvland to find them. They are near at hand. Every night some of them cheat at the bells in the Quadrant, and others pace the Piazza in Covent Garden. . . . The morality of the Country Wife and the Old Bachelor is the morality, not, as Mr. Charles Lamb maintains, of an unreal world, but of a world which is a great deal too real. It is the morality, not of a chaotic people, but of low town rakes, and of those ladies whom the newspapers call 'dashing Cyprians'. And the question is simply this, whether a man of genius who constantly and systematically endeavors to make this sort of character attractive, by uniting it with beauty, grace, dignity, spirit, a high social position, popularity, literature, wit, taste, knowledge of the world, brilliant success in every undertaking, does or does not make an ill use of his powers. We own that we are unable to understand how this question can be answered in any way but one."

Street, the most recent defender, in his introduction to the comedies of Congreve, argues that comedy is satire, that as satire it has to deal with the vices and foibles of society, that if it were to treat of love and the conventions of society it would be forced to satirise them, and hence they have no place in satiric comedy. He defends the fact that vice and folly are crowded into the plays on the ground that as art they should give a picture, not be photographic.

It may be interesting to hear the dramatists themselves on the subject. Shadwell in the preface to the *Sullen Lovers* expresses himself not without vigor:

"But in the plays, which have been wrote of late, there is no such thing as perfect character, but the two chief persons are most commonly a swearing, drinking, whoring, ruffian for a lover, and an impudent ill-bred tomrig for a mistress, and these are the fine people of the play, and . . . almost anything is proper for them to say; but their chief subject is bawdry, and profaneness, which they call brisk writing, when the most dissolute of men, that relish those things well enough in private, are shocked at them in public. And methinks, if there were nothing but the ill manners of it, it should make poets avoid that indecent way of writing."

And Congreve, in the dedicatory letter prefixed to the *Double Dealer*, defends himself as follows:

"But there is one thing at which I am more concerned than at all the false criticisms that are made upon me; and that is some of the ladies are offended. I am heartily sorry for it, for I declare I would rather disoblige all the critics in the world than one of the fair sex. They are concerned that I represented some women vicious and affected: how can I help it? It is the business of a comic poet to paint the vices and follies of humankind; and there are but two sexes, male and female, men and women, which have a title to humanity; and if I leave one half of them out, the work will be imperfect. I should be very glad of an opportunity to make my compliment to those ladies who are offended; but they can no more expect it in a comedy, than to be tickled by a surgeon when he is letting 'em blood."

One would rather avoid committing himself to immorality or unmorality. But, taking either, how many of us do not have interesting and entertaining friends whose code of action is not our own, yet whose society we continue to cultivate, extracting not a little pleasure from it.

Confining ourselves to these better known writers before 1700, a few general statements may be formulated in regard to their method.

In the subject that they treat they confine themselves to a limited section of but a part of the people. They reflect the park, the court, the street, the exchange, and even here they keep on the surface, dealing with such selected evils as dress, manners, speech. A love intrigue is commonly the central motive, but often overtopping it in interest is the clever dialogue in which many things are satirized. The attitude is one of satire and raillery against all established institutions; against marriage, the manners of society, the Puritans, the newly developing

sciences, the Court. Duelling, the country and its inhabitants, the opera, the new songs and novels, the affectation of foreign airs, the adoption of foreign words, poetry and dilettante writing, polite literary conversation, legal abuses, and almost every other subject that can occur to one are made subjects for biting comment by the wits and would-be wits in the plays.

In plot construction these writers are deficient, but while they were not able to manage the sustained elements of plot, in their separate situations the greatest skill is shown, and in the actual presentation these incidents should be most lively and interesting. The chief fault lies in too great intricacy or over elaborateness. Then, too, the plots are very often the elaboration of a stock theme, the most prevalent being the struggle on the part of a very brilliant young man to discard a mistress, who objects to being discarded, that he may ally himself with a virtuous young woman. The play ends in the discomfiture of the cast off mistress, and the marriage with the virtuous young woman, for despite his art, she will have him on no other terms. Allied to the main action are so many minor actions that it sometimes becomes difficult to keep the threads separate.

Quite closely allied to the main action is the affair between the servant of the hero and the maids of the women with whom the hero has to do. As often as the hero transfers his affections, so often does his servant, and for no other apparent reason. It may be added that the maids are always extremely mercenary and on the side of the intriguers.

The characterization is extremely vague and conventional. The heroes are all witty, wealthy, popular, while their life work is the pursuit of women. The heroines are all witty, beautiful, and while they do not hesitate to discuss matters not now generally discussed, are virtuous in action. The hero of almost any of the plays might be the hero of any other so far as any distinct qualities he may have, and it is likewise with the heroines.

But outside the small numbers of what may be called in modern stage terminology "straight" parts, are the quite large numbers of character parts, which become conventional types as the comedy reaches its height. Almost every play has its pretended wit; a fool who apes the men of sense and fashion, who thinks himself most clever, and who is perfectly oblivious to the fact that he is being made the butt of the few sensible characters. These are the Dapperwits, the Witwounds and the Tattles. Closely allied to this class is the fop who apes the French, thinks only of his dress, his appearance, the figure he makes. He is ostentatious in all he does, is single minded, but is really not such an awful fool as one imagines the first time he meets him. In Etherege's *Sir Fopling Flutter*, and in Cibber's *Sir Novelty Fashion*—the Lord Foppington of Vanbrugh's *Relapse*—we have two

master presentations of this character. Another interesting type is the Miss Hoyden-Prue-Hippolyta young woman, who has been kept in secluded ignorance of the world, but who shows a sudden ingenuity, knowledge of the world, and unexpected desire for the sensual joys of life. There are, of course, the elderly cuckolds, dominated and fooled by their wives, and the wives who protest virtue but do not practice it. But these, while prominent types in this period, are almost as prevalent in the comedy that precedes. In general the characters show a tendency to exaggeration, are a development of the drawing of "humours" of Jonson, with the same use of descriptive names—Courtall, Mrs. Frail, Lady Wishfort, Justice Clodpate to save the labor of characterization, and are lacking in complexity and in development.

The most of the plays are set in London, in localities familiar to the audiences. Within the class and localities to which the comedy restricts itself, it is a most interesting and valuable social document, but it must always be remembered that it is in no sense representative of the whole people. Sometimes we are taken to Spain or Italy, but it is Spain or Italy only in name, the people and the customs are all English. We may sometimes be taken to the fashionable watering places in England, but we are never taken to the despised country.

Of the many conventions contrary to ordinary human life which were so common to the Elizabethan drama, only asides and disguises have come down to this period, and of these the use of asides, which are heard by everyone but him whom they concern, has come down to our own day. It is in the exquisitely polished prose style and the epigrammatic dialogue that the comedy excels. The style is brilliant and the main source of interest in the plays is the intensely satirical wit and repartee.

There is nothing finer of its kind in English literature than the dialogue in Congreve's *Love for Love*. While we may wish at times that the fine ladies might show more delicacy in the topics they select for conversation, it is not a vulgar indelicacy, and the wit certainly pays subtle compliment to our intelligence, for it is no slight intellectual feat to follow at all times the brilliance and fineness and quickness, if not the depth, of the conversation.

Whatever else we may say of restoration comedy, it is certainly amusing. While its morals may not be all one might wish, and while its plots may lack coherence and probability, and while its characters may show a tendency to degenerate into fixed types, yet it is interesting and readable for its finish of style and brilliance of wit. And even though its plots and characters may not reach the ideal of an absolute artistic standard, they are second only to those of the greatest masters in the English drama.

ABSTRACTS OF THESES.

I. THE DEVELOPMENT OF THE REFORMATION-IDEA IN
THE HISTORY OF GERMAN LITERATURE.¹By GEORGE BRODTHAGE, PH.D., *Pastor*.

Reformation in the true sense signifies a returning to pure ideals of simplified truth, and reforming life and doctrine upon them. Reformation means correction and regeneration according to the simple and primitive standards. By "Reformation" we understand more than mere religious improvement. It means the regeneration of the German nation and the proclamation of independence in the spiritual, scientific and social life.

Liberation from scholastic tradition and from mediaeval class-prejudices, the rejection of the ecclesiastical authority in spiritual and scientific matters, as well as the rejection of the assumed prerogatives of kingly sovereignty, grew out of different views of the world based upon different national characteristics.

The restoration in the Lutheran reformation is only a part, though the main part, of the re-establishment of the German heroic spirit. In the Middle Ages all conditions of life were determined by religion; hence the threefold fight for liberty was centered in the Church.

The liberation of the German national life does not begin with the so-called Lutheran reformation. The first blow was dealt by science. The German reformation begins with the restoration of freedom in science by the Humanists. The reformation antedates Martin Luther, since it began with Erasmus.

The reformation broadly considered affected not only the Church and doctrine but reached all conditions of life, even though those who participated, may not have seen how much was involved.

The Lutheran reformation turns away from the scholastic-traditional adoration of the saints and turns back to the Christian Wotan whom in the "Wessobrunner Prayer" we learned to worship as the source of all good and of true knowledge. The German characteristic trait of the "spirituality of the worship of God" is restored. In science the German trait of "freedom of thought" and "speculative investigation of the intellect" comes to its own. All the German institutions and conditions of life had been at stake and must be regenerated.

This re-establishment of the German heroic spirit is accomplished in a series of reformations or revolutions (according to the standpoint

¹ Abstract of Part IV of a thesis submitted, May, 1907, to the Faculty of Graduate Studies of The George Washington University in part satisfaction of the requirements for the degree of Doctor of Philosophy.

of the student). After the scientific reformation followed the religious reformation; then the civil, involving equality of classes, the revolution of the knights under Sickingen and Hutten and the revolution of the peasants which, by the introduction of the "Roman law" in the 15th century, had been given over to serfdom. The two latter movements were premature. We recognize that the revolution of the peasants was not directed against ecclesiastical arrogance; that here as in the "Minne-service" of Thomasin the corruption was not the fault of the Church, but of the secular authorities; for the Church from the beginning opposed serfdom.

1. *The Importance of Martin Luther.*—(a) Luther led the German nation back to the true fountain of all good and knowledge.

(b) Therefore Luther is the prophet of the reformation, just as in a special sense the champions of Humanism (especially Erasmus) are prophets of free science. Luther is the prophet also of free science, for he saved free science for the religious reformation by establishing the vacillating Melanchthon.

(c) In Luther we reach the highest point in the spiritualization of the German character. We have followed the curve of the spiritualization of the German characteristics. First Thomasin had pointed out the falsity of the novels, and out of this knowledge grew the later uneasiness of the secular writers. Writers turn to spiritual subjects which they bring in opposition to worldly poetry. From the spiritual the curve passes over to the visionary, supersensible and (at the same time) coarsely-sensual in mysticism. Then all nature is spiritualized, allegorized, even popular poems. At the same time penitential zeal is awakened (the most touching seen in St. Elizabeth), while the superficiality of the Catholic doctrine of the forgiveness of sins furthers the cult of St. Mary and the saints. All this error and corruption is reformed by Luther on the basis of the Germanic character.

(d) The Lutheran reformation means the spiritual regeneration of the German.

(e) Luther's translation of the Bible has political-reformatory influence, and wrought for the union of the German tribes. By it Germany was preserved from being separated into two halves relating to language.

(f) His translation was a popular work. The great German poets (Klopstock, Herder, Goethe, Schiller) have drawn a great part of their riches as well as of their power of speech out of Luther's model work.

(g) The reformation is the declaration of independence of the German spirit which had then attained manhood.

(h) The Lutheran reformation is not the reforming of the Roman-Catholic Church, but it is the founding of the German-Christian Church based upon the German national character.

2. *The Significance of the Lutheran Reformation in the Development*

of the *German Spiritual and Cultural Life*.—The reformation was national German, popular:

(a) In its religious character.—Luther gave expression to the ideas and feelings which consciously or unconsciously were in the people. The union of Lutheran theology with Humanism accounts for the scientific character of the Lutheran reformation. But notwithstanding the scientific turn of the reformation in doctrine as well as in the scientific "school drama," the popularity of the Lutheran Church was preserved. From the ranks of the people a number of renowned champions of the Evangelical cause arose (Hans Sachs, Joerg Wickram, etc.).

(b) It attacks the unnational, selfish interests of papism as of a foreign power. In Protestant writings patriotic indignation discharges itself against the oppression of the fatherland by Roman lust of power and money. Patriotism and religion strengthen the national German self-consciousness.

(c) In its ethical character.—It restores the old Germanic view of the world as over against ascetic contempt for the world. The moral character of the reformation reveals itself in the advancing of sound evangelical ethics.

(d) A new life stirred among the German nation in the field of literature. A new era of poetry was in view. But before it came to fruition it was trampled down by the Thirty Years' War.

On the other hand this "devil among the wars" turns to blessing.

(a) The Thirty Years' War was historically inevitable. Scholastic and evangelical world-views were in conflict. But out of the conflict of war a better day was appearing as it appeared in America after the civil war. The seed of the reformation budded later, as also the blessing of the crusades was not instantly visible. Jesuitism arose, but Evangelicals relied upon the sword.

(b) Delivered from the bondage of centuries the German people were not able to bear the sudden freedom with moderation. There follows the reactionary storm bringing in iconoclasm, anabaptism, peasant war: the proclamation of the unrestrained freedom of the individual, the Gordian solution of all problems. Individualism was natural, but it prepared the field for a new planting. It is part of the world-movement and is not censurable. It is as natural as the development of the human body.

Our task is that of inquiring into the "Whence?" and "Why?" of the development, and to draw lessons for the "Now" and to find the way "Whereto?" And if history teaches, that where there is much light there must be shadow, it is true vice versa, that in the curse of the Thirty Years' War there is a blessing.

The German cultural life after Luther does not at first ascend, but ~~eyes~~ ^{sinks} down to a deeper decadence than it reached before the reforma-

tion. The mediaeval abuses were too deeply rooted in this generation to be peaceably overcome by the reformation. The mediaeval currents continue in the so-called era of the reformation to the Thirty Years' War.

(a) Freedom of conscience taught by the reformers becomes *Protestant* fanaticism, "rabies theologorum." In 1553 Michael Servetus was condemned to the stake by Calvin (and that with the approval of nearly all the renowned theologians, even of Melancthon and of Urbanus Rhegius), because he opposed the ecclesiastical doctrine of the "Trinity."

(b) Serfdom of the peasantry becomes still more oppressive.

(c) Scholastic mysticism was retained in Jesuitism. The divine trinity is changed to a quaternity in which St. Mary appears as daughter of the father, mother of the son and wife of the Holy Ghost. Jesuitism renews also the worship of St. Anna, whom Thomas de St. Cyrillo in his "de laudibus beatae Annae" celebrates as grandmother of God and mother in law of the Holy Ghost.

(d) The deceit of the mediaeval "Minne-service" is continued in the doctrine of the probabilism, intentionalism, the doctrine of the "reservatio mentalis," and find their climax in Busenbaum's: "Quia cum finis est licitus, etiam media sunt licita" (since the end is allowed, the means are also allowed).

(e) The mystic doctrine of the "to become to naught" of the soul in God finds its goal in the Jesuitic "doctrine of the corpse."

(f) Worship of relics, superstition, miraculous legends, flagellation, indulgence, belief in witchcraft and demonism run riot.

(g) The utter decadence of the heroic spirit is already accomplished in "Der hürnen Seifrid" (the Horny Siegfried) by Hans Sachs.

How low it stood in the age of the reformation is shown by the irresolution of the Evangelicals in the war of Schmalkalden.

With unmanliness is coupled inhumanity. We see the inhuman manner of waging war in "Kudrun," where Wate does not spare the nursling at the breast. This fiction becomes practice on a smaller scale in the "Veltliner Mord," a Swiss "Night of St. Bartholomew" in 1620.

(h) Instead of the belief in the "sanctity of woman" we have the idea degraded into the belief in witches.

(i) The German imperialism gradually became antinational. (The war of Prussia against Austria in 1806 was a reformatory act.)

Summary: The mediaeval abuses had rooted so deeply in the German nation that also the Lutheran reformation could not overcome them peaceably. This generation was so corrupted through the bondage of centuries that it could not appropriate the pure treasure of the gospel. As the flood destroyed the old mankind; as the people of Israel per-

ished in the desert, so the war (the Thirty Years' War) cut off that generation.

Well is Martin Luther the prophet of the restoration of the heroic spirit of the Germans. The German ideal of man is not secular alone nor religious, but comprises both in Germandom. Chivalry is purified through the reformation and suitably characterized in the device: "With God for King and Fatherland," or "We Germans fear God, and nothing else in the world." The end of the development of the character of the German man is the believing German man according to Arndt's direction: "What is man? He who can believe; he who can pray."

The new spirit is voiced by Gustavus Adolphus before the battle at Luetzen when with his army he kneels down to pray for the evangelical cause and intones as a Christian soldier: "A mighty fortress is our God." So before him in the "Ludwigslied" rang the "Kyrie eleison." So, too, after the battle at Leuthen the Prussian army sang: "Now thank we all our God." From stage to stage the development moves. The device of evangelical Germany, "With God for King and Fatherland" witnesses to the re-establishment of the German heroic spirit.

Not only was the reformation of the German character involved but also of the classic German institutions—the restoration of and heightening of the primitive Germandom itself.

(a) "With God for the King," repudiates autocracy, and kingship is to be re-established according to the primitive Germandom. The old German king pledged his life to his followers. The fulfillment of this idea we find in the kingly word: "I am the first servant of my State" (Frederick the Great). The Romance kingship expresses itself in the king's word: "L'Etat c'est moi."

(b) "With God for the Fatherland." The Middle Ages did not know a German fatherland; the brother tribes tore one another to pieces. Once the individual stood up for his "sippe." This family-sense is clarified through the reformation to the modern patriotism, while the idea of the "revenge for blood" is clarified to the sentence: "We, as of one stem, stand also for one man." The goal of the development of the German character is the reformation of the German nationality to the classic primitive Germandom of Tacitus after the measure of the primitive Christianity on the foundation of the Bible (correctly translated by Humanism).

So is realized at last the goal: "With God for King and Fatherland."

II. MECHANISM AND TELEOLOGY.¹

By EDWARD ELLIOTT RICHARDSON, M.S., PH.D.

This thesis is a consideration of mechanism and teleology from an empirical, epistemological and ontological standpoint. In accordance with this plan the discussion proceeds in the following order: The first chapter is devoted to the definition and description of the principle of mechanism. This is followed by a similar chapter on teleology. In the next succeeding chapter there is undertaken an investigation of mechanism, considered empirically. This again is followed by a similar chapter on teleology. The last chapter of the thesis deals with the concepts of mechanism and teleology, both epistemologically and ontologically.

The first chapter, as indicated above, attempts to define and describe what mechanism is. The classic definition of mechanism by Laplace is quoted as also one by Emilo du Bois-Reymond and G. H. Lewes, as well as references to others. Mechanism considers phenomena as the necessary outcome of various laws of nature, e. g., those of matter and motion. The universe is conceived as a vast and complicated mechanism whose different parts bear such a relation to each other as is by analogy expressed by the relation which parts of a machine bear to each other. The present state of the universe is the effect of the antecedent state and this present state is the cause of the succeeding state and ad infinitum. The apparent incomprehensibility of all the events of the universe is according to a strict mechanistic view only due to the multiplicity and vastness of detail of such facts rather than to any inherent difficulty in the understanding of all phenomena and problems. The totality is as capable of being intelligently understood in all its relations and intricacies as a simple problem in mechanics—the difference being one of extent and detail. The totality can be expressed, i. e., it is possible to do so, in one vast formula or subsidiary formulae. The "dead mechanism" of Mr. Gladstone as well as the question of spontaneity are considered in this connection. The distinction between a mechanism which relates principally to form, which is concerned more especially with laws or forces as something external giving the form rather than the matter or content, and a second deeper aspect of mechanism which conceives the universe in its totality as mechanistic, automatic, self-sufficient and undervived is presented as well as modifications of these two more well demarked positions. The relation of science to mechanistic thought is considered, and the chapter closes with a metaphysical statement of the relation which objects bear to

¹ Abstract of a thesis submitted May, 1907, to the Faculty of Graduate Studies of The George Washington University in part satisfaction of its requirements for the degree of Doctor of Philosophy.

each other in accordance with a mechanical view. Chemism as relates to objects is also considered in the same connection.

The definition and description of teleology which is undertaken in the second chapter proceeds in several stages. First teleology is defined or described according to a semi-popular notion. Here the conception of teleology is antropocentric. Man is the center or goal towards which all things tend either as a bodily, ethical or spiritual relation. This is a view of the world from a subjective rather than an objective standpoint. The suppositions, either implicit or explicit, underlying this form of teleology are mentioned.

The relation of mechanism to teleology is next considered from two different points of view or two classes of such a relation. The first regards the purpose which is affirmed to exist as being superimposed, as it were, upon the world by a being or intelligence outside of the world itself. The purposiveness found under such circumstances is an extraneous relation imposed upon the things constituting the world. The material of the things is used as a mechanician uses a machine to accomplish a certain result or end. The material used in the realization of purpose is in itself indifferent to the end of which it becomes the means. The second of the above indicated relations considers purpose as immanent in the world, as an inner purposiveness. Such a conception of purposiveness as this gives a constitutive as opposed to a regulative valuation to the category in question. The theory of evolution is commented upon in this connection.

Teleology is next considered psychologically and ethically. The psychological end is stated to be an end that is desired or that the mind is aware of, the end is present in the mind as an idea and is desired. The ethical end is something which is good in itself and not merely as a means to that which is good.

Reference to the Kantian use of the term teleology is made. It is maintained here that the use of this term by Kant is somewhat looser than a strict employment of the term would warrant. That is, there is little effort by him and those following this same line of usage of the term, made to differentiate the manner in which the end is cause of the means. To regard the end as an effect and the means as a cause of that effect does not indicate the closer relation existing between the two than is indicated by the ordinary use of the term causality.

Finally, teleology is considered metaphysically as regards the relations of objects to each other when brought under the category of teleology. The closing part of this chapter refers to the three characteristic types of teleological theory found in the history of philosophy.

Chapter three is, as its name indicates, a discussion of mechanism as applied to the concrete facts of experience. The conclusion reached in this discussion is that mechanism when so applied is inexact and its greater exactness in any particular instance is purchased by an increas-

ing abstraction. Although it is impossible to construct a perfect circle or a perfect square, yet the mathematician is constantly making use of such figures, so the mechanician is constantly making use of laws and formulae which it is impossible to completely actualize in experience. That is, there is a difference, an inexactness, between actual perceptual reality and ideal conceptual constructions. The knowledge which is attained by the mechanician as the result of the abstract method which he makes use of is not concrete and viewed in all its relations. There is the liability that it will be so regarded and when hypostasized as such there is the liability that the superstructure built upon the abstract foundation will be regarded as having itself concreteness, the abstraction which has been present being lost sight of. Thus the various sciences which, while yielding results that are of value in the sphere in which they are obtained, yet cannot properly claim to have the same validity and application in other places. This fact, of course, does not discredit the proper field or value of these results, but has to do with the limitation of results as regards their applicability or universality when such knowledge is of a restricted origin.

The discussion passes through a consideration of mass, motion, molecules, atoms, statistical averages, etc. Various difficulties that are encountered in this connection when mechanical theory is made use of in experience are discussed. The conclusions reached in this connection are in the main along similar lines as those of Prof. Ward, as, for example, the difference between motion in a concrete case and the motion which the physicist is forced to make use of. This chapter is not to be understood as being polemical towards mechanism, but the endeavor is to point out certain limitations and difficulties of the mechanical theory when empirically considered. From this standpoint it may be said that the mechanical theory is untenable, as some writers would have us believe. This is not, however, the final estimate that is to be placed upon mechanism. That much has been accomplished by the pure mechanist no one in fairness can deny. Mechanism is true as is also teleology, but the universe is not all mechanism, neither is it all teleology. The work done by the mechanist is not vitiated unless forgetting himself he should come to regard his work as too ultimate or too final.

The investigation of teleology from an empirical point of view occupies the fourth chapter of this thesis. The first part of this chapter is taken up by a discussion of chance. The possibility of chance and the exact meaning to be attached to the word is considered. The definition of chance by Aristotle, Arago and Cournot are given and commented upon. The question of chance is taken up in connection with teleology inasmuch as it bears a certain relation to teleology in the ascription of chance or of design to a given phenomenon as the case may be, it being a matter of experiential fact that frequently a single or

limited number of coincidences are ascribed to chance, while a larger number of coincidences are not but may be affirmed as due to design.

The main question that is discussed in this chapter is, however, the question in regard to the demonstration of the existence of teleology on empirical grounds alone. The conclusion here reached is that such a demonstration is impossible. This conclusion does not deny the existence of teleological principles, but that some other method or way is necessary to make certain the existence of this principle than the mere accumulation of evidence obtained from an examination of phenomena, empirically. The contention here is that the empirical consideration of supposedly purposive phenomena will only yield a probability of such phenomena being due to teleologically acting causes inasmuch as there always remains from an empirical standpoint of this kind a certain element of uncertainty, i. e., there always remains a possibility that any given phenomenon may have been occasioned by other causes. **It is not denied, however, that the probability of such an happening may indefinitely recede but as long as the possibility of such an happening being due to other than final causes there must always remain a certain degree of uncertainty and consequently a lack of complete demonstration.** The existence of such a principle as finality would, on this ground alone always remain more or less of an open question. That the probability of the definite existence of this category would be so great as to compel universal acceptance may be doubted as the history of the past clearly shows. Numerous instances are not wanting where certain phenomena that have been cited in support of the presence, in nature, of finality have been later shown to be capable of explanation by mechanically acting causes alone. This position taken in this chapter is thus at variance with that of Prof. Janet, as evidenced in his book on Final Causes. **An examination of "order" is also made in this connection as to whether any advance is made towards teleology in this way as has been maintained.**

The concluding chapter deals with the subject matter of this thesis epistemologically and ontologically. A preliminary reference is made to an unconscious bias frequently manifested in regard to various philosophic movements. The question is raised as to whether it is necessary for us either to accept one and reject the other of the two principles under consideration, i. e., are they mutually exclusive. Also, the question if one or the other or both are accepted as true what is the limitation of each?

A discussion follows at some length as to what the so called laws of nature really are. Whether these are to be considered as does Prof. Pearson, for instance, merely as "shorthand" descriptions of perceptual experience or whether they have an objective validity and force independent of the percipient, as well as modified views in regard to the same.

Natural science as regards its aim and scope is considered and exception is taken to that view of natural science which sees in it nothing but an aim to understand nature for the purpose of interference in the course of events for practical purposes. A distinction is made, between science as knowledge and applied science—a distinction that is apparently forgotten by those who see only the latter.

A discussion of the Kantian position as regards mechanism and teleology occupies a considerable part of the concluding portion of this thesis. The contention of Kant that teleology is only regulative rather than constitutive, as is mechanism, is criticized. The question of the mutual exclusiveness of these two categories as regards each other—that they are in reality incompatible as is affirmed by Kant—is here denied. The conclusions reached are that purposiveness is a necessary principle which is an intrinsic part of the constitution of the universe—that belongs to its very nature and is not something supplied from without by the cognitive faculty of a perceiving subject. Teleology is not imposed upon things simply in order that a gap in our apprehension or knowledge of these things may be bridged over. Herein is a deficiency in the Kantian philosophy which regards it as a kind of makeshift, a *dernier ressort* to be brought in where other principles have failed. The inadequacy of mechanism as regards universality and ultimateness, is not due to a limitation of our human faculties, but this inadequacy lies in the very nature of the concept itself. The category of mechanism becomes exhausted before it can afford a complete explanation of things and a new and higher principle becomes necessary. This new principle is a truer one than that which it has superseded. The supersession that is accomplished here is in the sense of the German word *aufheben*. To disparage one of these two principles to the enhancement of the other is unnecessary and unjustifiable, although they do not stand on an equality when considered in relation to reality. To conceive nature only under the form of mechanism gives only a partial comprehension of nature. Likewise to conceive nature as only the concept of teleology is to place purpose and end where it does not belong and to make in some cases ridiculous applications. Considered from the view-point of a historical genius of the knowledge of reality one of these principles has the same worth and significance as the other. It is the union of the two, which Kant has declared not to be "rationally comprehensible," that makes possible an understanding of nature. Neither the one or the other is sufficient alone for this comprehension. This does not mean, however, that we are compelled to subscribe to some of the rather over-stated positions that, for instance, mechanism cannot be held ever in its most meager outlines or simplest formulations without there being at the same time a teleology connected therewith. Mechanism is not teleology, neither is teleology mechanism.

III. THE SIMULTANEOUS MEASUREMENT OF THE CAPACITY AND POWER FACTOR OF CONDENSERS.¹

By FREDERICK W. GROVER, PH.D.

In a condenser having absorption, the angle of advance between the current and the electromotive force is less than 90° by a small angle θ , the power factor being equal to $\sin \theta$. A condenser having absorption is equivalent, therefore, in its effect on the phase of the current, to a capacity in series with a small resistance r of such a value that $\tan \theta = pCr$ (where $p = 2\pi$ times the frequency) or to a capacity in parallel with a large resistance R such that $\tan \theta = \frac{1}{pCr}$.

The power factor of a condenser is more accurately measured by determining this small angle θ than by direct measurement of the energy loss itself. Such measurements of the phase difference have been made by Potts² using one of Rowland's electro-dynamometer methods, and by Rosa,³ who has developed a number of dynamometer methods, and shown that they give results in good agreement with one another, and with his results on the same condensers by a calorimetric method.⁴

In 1891 Max Wien⁵ gave several alternating current bridge methods for the measurement of inductances and capacities. Among these is one where the absorption of the condenser to be tested, which he represented by a resistance in parallel with a capacity, is compensated for by an adjustable resistance in series with the standard capacity. The absorption of the latter is assumed to be zero. An elaborate investigation of the energy losses in the dielectric of cables has been published, since the work in this paper was begun, by Monach⁶ in which Wien's method was successfully used.

The following three bridge methods have been found satisfactory. In the first three, each side of the bridge consists as usual of a capacity in series with one of the ratio coils. The phases of the currents in the two sides of the bridge are brought into unison:

1. By an adjustable resistance in series with the standard condenser.

¹ Abstract of a thesis submitted May, 1907, to the Faculty of Graduate Studies of The George Washington University, in part satisfaction of the requirements of the degree of Doctor of Philosophy.

² Amer. Jour. Sci. (4), 10, p. 91, 1900. Phys. Ze., 2, p. 301, 1901.

³ Bulletin of Bureau of Standards, 1, p. 383, 1905.

⁴ Rosa. Phys. Rev., Feb., 1899.

⁵ Wied. Annalen, 44, p. 681, 1891.

⁶ Inaugural Dissertation, Dantzig, 1906.

2. By an adjustable resistance in parallel with the standard condenser.
3. By a variable inductance in series with that ratio arm which is adjacent to the condenser to be tested.

Method I.—This is the same in principle as that of Wien, described above, except that, whereas he derived the formula on the assumption that the resistance representing the absorption was in parallel with the condenser, the author has adopted the assumption that it is in series with the condenser. The expression is, in this case, simpler, more symmetrical, and allows its physical significance to be more readily seen. Physically, it is, of course, immaterial which assumption is adopted since we are only concerned with the change in the phase of the current due to the presence of the absorption.

It is more convenient in practice to introduce a series resistance ρ into each condenser arm. Then

$$\frac{C_1}{C_2} = \frac{R_2}{R_1}$$

$$\tan(\theta_1 - \theta_2) = \rho C_2 \rho_2 - \rho C_1 \rho_1$$

Method II.—To avoid the necessity of working with resistances of several megohms it is best to put a resistance ρ in parallel with each of the condensers. Then

$$\frac{C_1}{C_2} = \frac{R_2}{R_1}$$

$$\tan(\theta_1 - \theta_2) = \frac{1}{\rho C_2 \rho_2} - \frac{1}{\rho C_1 \rho_1}$$

This method is not so good as the other two, since the sensible electrostatic capacities, inseparable from such large resistances, must be added to the capacities of the condensers. The power factor measurement is not, however, affected by these capacities.

Method III.—In practice a fixed inductance L_2 is inserted in one arm and a variable inductance L_1 in the other. Then

$$\frac{C_2}{C_1} = \frac{R_1}{R_2}$$

$$\tan(\theta_1 - \theta_2) = \frac{\rho L_1}{R_1} - \frac{\rho L_2}{R_2}$$

This method has the advantage that nothing is placed in the arms with the condensers. It is, therefore, especially adapted to the comparison of capacities as small as 0.001 mf, where in Method I the errors due to capacity of the large resistances r , required with such small capacities, may become appreciable.

To obtain the most precise results with these three methods, the condensers should be nearly equal in capacity and power factor, and it

is best to balance each of the two capacities against that of a third auxiliary condenser. This procedure has the following advantages:

1. Errors due to electrostatic induction between the bridge and its surroundings are practically eliminated.

2. The ratio of the two capacities is proportional to the two nearly equal settings of the same resistance box, making an accurate determination of the actual values of the coils unnecessary.

The following method has been found satisfactory and is especially valuable as a check on those already given, since it is very different in principle.

Method II'.—It has been shown¹ that in the comparison of an inductance with a capacity by Anderson's method, the effect of the absorption of the condenser on the value of the inductance obtained is in all ordinary cases extremely small. The difference in the actual value of the resistance Q' of the arm containing the inductance from the value Q with direct current, due to the absorption of the condenser may become very appreciable.

$$Q' = Q + \rho L \tan \theta$$

$$\tan \theta = \frac{Q' - Q}{\rho L} \quad (A)$$

If settings be made with first one condenser, and then with the other

$$\tan (\theta_1 - \theta_2) = \frac{\Delta Q'}{\rho L}$$

where $\Delta Q'$ is the difference between the values of Q' in the two cases, and

$$\frac{C_1}{C_2} = \frac{2r_1 + P}{2r_2 + P}$$

if the ratio arms P and R are equal.

This is inherently a substitution method, and by properly choosing L so as to give a satisfactorily large value to ΔQ , good results have been obtained.

The absolute values of the power factor of a condenser follows at once from measurements with these methods, if some standard of reference is at hand. For capacities of 0.1 mf and smaller, comparisons were made directly with air condensers of negligible leakage. The values for the larger capacities were obtained by stepping up from 0.1 mf, using the relation that the resultant power factor f of two condensers of capacities C_1 and C_2 and of power factors f_1 and f_2 is given by

$$f = \frac{C_1 f_1 + C_2 f_2}{C_1 + C_2}$$

¹ Ross and Grover, G. W. U. Bulletin, vol. 1, p. 312, 1905.

As a check on this process, the power factor of a 1 mf condenser was determined by using formula (A) of Method IV, the observed value ($Q'-Q$) being corrected for the effect of the known residual inductances and capacities of the arms of the bridge. The result agreed closely with that given by stepping up from the 0.1 mf air condenser. Care must be taken in using formula (A) that the change in resistance of the coil L with the frequency is negligible, otherwise it must be determined and allowed for.

RESULTS.

These four methods have been tested by measurements on a large number of condensers, at frequencies between 30 and 1000 cycles (using vibration galvanometers to balance the bridge). The capacity ratios obtained by the different methods agree to a few parts in 100,000, while the differences ($n_1 - n_2$) do not differ more than can be explained by the errors in the setting of the bridge. It has been found

1. For good mica condensers the angle θ may be as small as $0' 30''$ and as large as $4'$. Poorer mica condensers, especially if their capacity is small may give values of θ as large as $30'$ or even more.

2. Good condensers with paraffined paper for a dielectric have a value of from $5'$ to $20'$; for poor telephone condensers angles as large as 10° have been observed!

3. For all the mica condensers examined the angle θ diminishes slowly as the frequency rises.

4. The same result was observed with all the poorer paper condensers, but with some of the better paper condensers the effect was in the opposite direction. The changes are all greater than in the case of mica condensers.

5. Above 20° the power factor increases with rise of temperature both in mica and in paper condensers, the effect being small for the former and very large for some of the poorer paper condensers.

Since the power factor depends primarily on the absorption, the leakage having but a small effect the value of the power factor would be expected to give a relative indication of the magnitude of those effects which depend on absorption, viz.: residual charges, change of capacity with the frequency, dependence of the apparent capacity on the time of charge and discharge, etc. Ballistic measurements show that this hypothesis is substantiated qualitatively and, approximately, quantitatively. A measurement of the power factor gives, therefore, valuable information as to the quality of the condenser.

These effects of changes of frequency and temperature are being more thoroughly investigated.

In Memoriam.

JAMES CARROLL, M. D.

JUNE 5, 1854.

SEPTEMBER 16, 1907.

By PROFESSOR CHARLES E. MUNROE,
Dean of the Faculty of Graduate Studies.

The death of James Carroll, M.D., Surgeon and Major U. S. Army, on September 16, 1907, inflicted a very serious loss upon The George Washington University, and brought sorrow to the hearts of his many associates in the faculties of that institution, with which he had maintained an active connection for some twelve years.

He was appointed a Demonstrator in the Medical School of the George Washington (then Columbian) University in 1895 under the supervision of Dr. Walter Reed, Surgeon U. S. Army, who was then, and for many years, Professor of Pathology and Bacteriology in this Medical School. In 1902, Dr. Carroll was promoted to Associate Professor of Bacteriology and Pathology, and appointed to succeed Professor Reed, as Pathologist to the University Hospital. In 1905, he was promoted to a full professorship in the Department of Medicine, and also given supervision over the students pursuing researches in Bacteriology under the direction of the Faculty of Graduate Studies.

Professor Carroll's connection with the University included the period during which the University Hospital was created and set in operation, and the new Medical School building, which is well adapted to its intended purposes, was built. Dr. De Schweinitz, Dean of the Medical School, relied much upon the judgment, special knowledge and experience of Dr. Carroll in planning the building; and the excellent bacteriological laboratory with which the Department of Medicine is now provided, was largely due to Dr. Carroll's advice and active supervision.

Throughout his connection with the Department of Medicine, Dr. Carroll was a most devoted and assiduous teacher. Kindly in spirit, tolerant in views, in sympathy with youth, lucid in exposition, earnest in manner, a master of his subject and skilled in its technique, he commanded the respect and esteem of his students and compelled, by force of character and restrained enthusiasm, an interest in the subject taught.

When Dr. Carroll became connected with the Medical School the entire course of instruction in this, as in all other professional schools

in Washington, was given after office hours, and late into the evening, in order to accommodate, not only the many students who were employed in the various departments of the United States Government, but also the eminent specialists who were willing to assist in the promotion of medical education. During his connection owing to criticism on this method of procedure, the entire plan has been changed, a growing nucleus of professors giving their whole time to the conduct of the school has been formed with practitioners and specialists grouped about them, the instruction is begun in the early forenoon and continued throughout the day and the plan made to conform to the most approved examples. Throughout this work of reorganization, Dr. Carroll gave able assistance and so adapted the work in his topic and selected his assistants with such excellent judgment that the students continued to benefit by his talents and knowledge, and to be subject to his beneficent influence.

In faculty meetings, as in his teachings and his scientific work, he held to strict standards and high ideals, but while expressing his views with definiteness and maintaining his position with firmness, he manifested a willingness to listen and to be convinced. He differed from his associates without acrimony and accepted an adverse decision without cherishing resentment. In fact, his entire relations were characterized by a determined gentleness and thoughtful consideration.

Dr. Carroll was without doubt ambitious; but his ambition consisted in the indestructible desire to do well everything that he was called upon to do. Whatever work he was engaged upon, no matter what might be its extent or importance, he could never be content with doing less than his best. The same lofty purpose and the same careful judgment were applied to all he did, in small things as in great things. No man of his high character and just discernment could be free from likes and dislikes; but no man ever took more care to avoid injuring by word or deed those who failed to win his esteem or regard. Free from malice and prejudice; calm and dispassionate in judgment; even in temper; kindly and amiable in manner he kept on good terms with those about him. But the trait in his character which perhaps most forcibly impressed those who came in contact with him was his absolute straightforwardness and reliability. He was utterly without subterfuge or reservation. He was a man whom you felt implicit confidence in. There was therefore no man in the faculties who commanded more universal respect and regard than James Carroll; and none have died more universally regretted.

BRIEF MENTION.

Messrs. G. P. Putnam's Sons have recently published a Text Book on Plain and Spherical Trigonometry, by Professor J. Howard Gore, head of the mathematical department of the University.

Although issued but a few weeks ago, the first edition has already been exhausted.

In May Dr. George P. Merrill, Professor of Geology and Mineralogy, was sent by the Smithsonian Institution to study the remarkable crater-like depression near Cañon Diablo, in Arizona, and incidentally, visited the Grand Cañon of the Colorado and the fossil forest. His report on the origin of the crater is now in course of preparation. Incidental to this he has published two brief papers, one relative to a peculiar phase of metamorphism in the siliceous sandstone found in the crater, and the other bearing upon the nature and origin of the meteoric irons for which the locality is noted.

In a volume on the "Mineral Resources of Virginia" prepared as a memoir of the Jamestown Exposition, and just issued by the Virginia Geological Survey, Dr. R. S. Bassler, Assistant Professor of Geology, has an extended article on the geology and stratigraphy, and the non-metallic minerals of the State. Professor Bassler has spent his summers during the past four years in a detailed study of the complicated stratigraphy of Appalachian Virginia, and the results of this work are given in this volume. All the minerals of any economic importance are touched upon and numerous cuts and structure sections illustrating the occurrence and genesis of the more important materials are included.

"The Essentials of Aesthetics," by Dr. G. L. Raymond, Professor of Aesthetics, contains the course of lectures delivered in The George Washington University, for the first and only time in 1905-06. The book was published last spring by G. P. Putnam's Sons of New York, and John Murray of London. We take these notices of it from Putnam's Monthly.

Its superior in an effective all-round discussion of its subject is not in sight.—*The Outlook*.

So lucid in expression and rich in illustration that every page contains matter of deep interest even to the general reader.—*Boston Herald*.

It can hardly fail to make talent more rational, genius more conscious of the principles of art, and the critic and connoisseur better equipped for impression, judgment or appraisement.—*N. Y. Times*.

In spite of all that has been written on the subject from widely contrasted standpoints, this manual has distinct claims on students.—*The Standard* (London).

His evidence is clear and straightforward, and his conclusions eminently scholarly and sound.—*Vanity Fair* (London).

Dr. Raymond's book will be invaluable. He shows a knowledge both extensive and exact of the various fine arts and accompanies his ingenious and suggestive theories by copious illustrations.—*The Scotsman* (Edinburgh).

Professor Raymond has another book in press, "The Psychology of Inspiration," to be published in January, 1908, by the Funk and Wagnalls Company.

The work of Brigadier General Henry L. Abbot, Professor of Hydraulic Engineering, on the "Problems of the Panama Canal," (The Macmillan Company, 1907) has attracted considerable attention and a second edition was published a few months ago. The *Scientific American*, August 24, 1907, speaks of it as follows: "Brigadier General Henry L. Abbot, who was for seven years connected with the work in question, has written of the problems of the canal in a manner that deserves the highest commendation. His book is a minute and painstaking description of every detail of the great labor, with full tables of statistics in every department of the work, yet so remarkably is the subject matter composed that the interest to the casual reader is not destroyed. The engineer in search of exact information, and the laymen wishing for general information will both find it equally interesting."

Similarly the *Engineering News*, May 16, 1907, says: "The first edition of this book appeared about two years ago before the final determination was made of the type of construction. In the present edition, General Abbot brings the work up to the beginning of 1907 by the addition of a chapter dealing with the history of the work since the United States assumed control in 1904."

General Abbot has now on hand, a paper on the "Present Status of the Panama Project," prepared at the request of Professor Emory R. Johnson, Editor of the *Annals of the American Academy of Political Science*, to form part of a volume on "The Use and Development of American Waterways," to be published by the Academy next January.

Professor Hermann Schoenfeld, head of the Department of German, has been granted a year's leave of absence by the University, which he will spend partly on a diplomatic mission in Germany, Austria, and the Orient, in connection with the establishment of the Turkish Embassy at Washington. While in these countries he will put the finishing

touches to a scientific work on which he has been engaged for fourteen years, namely, the investigation of the Slavonic elements in East German civilization, history and literature. Professor Schoenfeld has formulated the substance of this investigation in an earlier work on Higher Education in Russia, Austria, and Prussian Poland, United States Bureau of Education, Government Printing Office, 1890, pp. 715, 716, in the following words:

"Indeed the colonization by the German element of all that land is nothing but a protracted struggle, beginning as early as Charlemagne's time and not finished yet by far, to subject, to absorb, or to annihilate the Slavonic, principally Polish, population that has expanded over the territory vacated by the German tribes during the first migration of peoples. For Leopold von Ranke's statement: 'Es sind zwei Völkerwanderungen, durch die der Umkreis der deutschen Gebiete aus dem inneren Germanien her bestimmt worden: die eine war nach dem Westen, die andere nach dem Osten gerichtet,' is absolutely correct. But while the Germanic tribes had pushed themselves forward toward the West and South in powerful streams and in a comparatively short period of time, the backward flood toward the East against the natural course of Slavonic immigration occurred slowly, gradually through many centuries, often interrupted by long pauses, historically not determined. While during the first migration Teutonic pagans pushed beyond the boundaries of Germania, it was Catholic Christianity, the victorious Roman Church, the monks, who accompanied the progress of the Germans; later on it was the Reformation which led thousands and thousands toward the East. It is, of course, not to be forgotten that a second main incentive was the craving for material wealth and worldly power which made such invasions very bloody, cruel and unjust, full of epic battles and adventures so graphically described in Mickiewicz's *Konrad Wallenrod*, concerning the struggle between the Lithuanians and the Teutonic knights."

An editorial in the *Oil Paint and Drug Reporter*, March 11, 1907, Vol. LXXI, No. 10, page 7, contains a brief synopsis of Professor Munroe's census report on the petroleum industry, from which we quote as follows:

"The present issue of the *Reporter* contains the quinquennial census of the petroleum industry of the United States, compiled by Dr. Charles E. Munroe, Professor of Chemistry in The George Washington University. It is one of the most exhaustive reports probably ever issued upon the same subject and will be read with interest by all trades dependent directly or indirectly upon petroleum. The compiler of the statistics not only goes into minute figures in a series of comparative tables covering a period of twenty-five years immediately antedating 1905, but he

takes particular pains to show the cost and growing importance of the industry owing to the extraordinary increase in the number of uses to which petroleum is now applied in different stages of its distillation.

"Beginning with the manufacturing establishments employed in the conversion of crude petroleum into various marketable products, the capital employed and the producing cost of their outturns, the figures show an increase in the number of establishments from 1900 to 1905 of 31, or from 67 to 98, while the capital employed in the industry has swelled no less than \$40,952,649, or from \$25,327,802 in 1900 to \$136,280,541 in 1905. The value of the products increased within the same five years just \$51,075,930. The salaries and wages paid had risen to \$18,010,881, which is \$6,151,543 in excess of those paid in 1900. And for materials used \$130,387,213 was paid against \$102,859,341. It would appear from this showing that the cost per unit of production was somewhat in excess of what it was five years ago, but there is no questioning the general increased prosperity . . .

"Professor Munroe, after touching upon the statistics and their effect on trade, concludes his investigation with an exhaustive treatise upon the methods at present in vogue in the production of the various distillates and of the several uses of the latter for various commercial purposes. All tend to show an ever extending use of petroleum, which, despite discoveries in other competing fields, is steadily increasing its sphere of influence."

Ginn and Company, publishers, have recently announced in their College Greek Series, "The Attica of Pausanias" edited with introduction, notes, plans and excursions by Professor Mitchell Carroll, head of the classical department of this University. "The Attica" constitutes the first book of Pausanias's "Description of Greece," which is the most important Greek work extant on the archaeology and topography of ancient Greece. Owing to the wide-spread interest in archaeological investigations, "The Attica" is now being published in separate form for the first time in England or America.

The text offered is that of Hitzig-Bluemner edition (Berlin, 1896). It is accompanied by a commentary which presents clearly and concisely the latest results of modern research in archaeology. A topical outline enables the student to follow without difficulty the course of the author. The more important topics, such as the Enneacrunus, the Agora, the Acropolis, are treated in a series of excursions and illuminated with a rich supply of maps and plans. A select bibliography presents the most important reference books.

One of the most important publications of 1907 is the series of ten volumes bearing the general title of "Woman: In All Ages and in

All Countries," issued by the publishing firm of George Barrie & Sons, Philadelphia. George Washington University professors have contributed largely to the preparation of these volumes. Volume I, on "Greek Women," was written by Professor Mitchell Carroll; Volume II, on "Roman Women," by Professor Alfred Brittain, of Hobart College; and Volume III, on "Early Christian Women," was written by Professors Carroll and Brittain in collaboration. The Volume on "Oriental Women" is the work of Professor Edward B. Pollard, formerly Professor of Semitic Languages in this University, now of the Crozer Theological Seminary. The volume on "Teutonic Women," was prepared by Professor Hermann Schoenfeld, head of the department of German in this University. The other volumes of the series are as follows: "Women of Medieval France," by Professor Pierce Butler, of Tulane University; "Women of the Romance Countries," by Professor John R. Effinger, of the University of Michigan; "Women of Modern France," by Professor Hugo P. Thieme, of the University of Michigan; "English Women" by Professor Bartlett B. James, of Western Maryland College; and "American Women," by John Rouse Larus, Esq., of Baltimore.

During the summer months a commission headed by Dr. Paul Bartsch, Professor of Zoology, under the orders of the United States Government, began a thorough search of the Mississippi River and its tributaries to find out all that could be possibly known about the pearl-bearing mussels of that river. The expedition was appointed to examine into the habits and conditions of the mussel and to determine what could be done to save this lucrative industry, which is in danger of extinction owing to the fact that the amount of pearls found in the mussel shells has been steadily diminishing. As a consequence a button famine is threatened and the United States Government is doing what it can to revive and extend the button industry. One of the tasks of the commission was to consider the possibility of artificial propagation. **Professor Bartsch speaks of it as follows:**

"The difficulties of artificial propagation of the mussel are many. These may be overcome, but at present we do not know sufficient of the mussel and its habits to be able to form a definite opinion. It is a very simple thing to turn millions of eggs into fish, but the egg of the mussel passes through another stage before it becomes a pearl bearing mussel. After being hatched it is a parasite which attaches itself to a fish. Now while one mussel may produce 60,000 eggs, but a very small number of these will be hatched. That is one of the things the expedition desired to learn something about. If artificial propagation does not prove practicable, perhaps by protecting the fish and the mussels and having a closed season when mussels must not be disturbed the desired results may be attained."

It is too early to speak of the results of the expedition, as the scientists who were engaged in it are now studying the data which they have collected, but there is every prospect of hopeful results. Dr. Bartsch has been granted a leave of absence from the University for this session in order that he may carry on certain investigations for the United States Government in the Philippines.

Dr. Frank H. Bigelow, of the United States Weather Bureau, who is Professor of Astro-Physics in this University, has been placed in charge of the investigations of the phenomena of evaporation over large bodies of water, recently undertaken in connection with the drying out of the Salton Sea in Southern California. This large body of water, 45 miles long and 10 to 15 miles wide, and containing 440 square miles of evaporating water surface, lies in a very hot and dry region and affords an excellent opportunity to study evaporation on a large scale. The previous researches have developed several formulas which give very inconsistent results, and generally it is not known how to apply the results observed on small pans to large bodies of water. In order to gain a preliminary view of this subject Professor Bigelow conducted a campaign on evaporation at Reno, Nevada, during the months of July, August and September, 1907. A series of towers were erected at the Reno Reservoir and it was shown that this body of water, about 1000 feet square, is covered by a vapor blanket only 30 feet deep, and over-stretching a very few hundred feet beyond the boundaries of the water. The evaporation from small pans was two or three times as rapid at the top of the central towers as at the water surface, and in fact the density and depth of this blanket of vapor is a principal function in determining the rate of evaporation. The work will be transferred to the Salton Sea, where the action of this blanket will be investigated on a larger scale. The fact that pans depend upon their immediate environment in the invisible vapor and covering that hangs over the water is sufficient reason why divergent results have been found by previous investigations. Nature throws a protecting cover of vapor over bodies of water which tends to conserve them from loss by evaporation, and it is now quite probable that the Salton Sea will dry out at a rate more nearly four feet per year than eight feet, as was very generally assumed. The definite knowledge of these broad facts is of interest to engineers engaged in irrigation projects, to growers of plants and to meteorologists generally.

UNIVERSITY APPOINTMENTS.

DEPARTMENT OF ARTS AND SCIENCES.

Assistant Librarian: M. ALICE MATTHEWS.

Graduate of State Normal School, Warrensburg, Mo., 1890; Bachelor of Library Science, University of Illinois, 1903; Assistant in Catalogue Division, Library of Congress, 1903-'05; Librarian, University of South Dakota, 1905-'07.

FACULTY OF GRADUATE STUDIES.

Assistant Professor of Mathematics: LOUIS COHEN, B.S.

B. S., Armour Institute of Technology, 1901; Graduate Student, University of Chicago, 1902-'03, Columbia University, 1903-'05; Bureau of Standards, 1905-—; Associate Member American Institute of Electrical Engineers; Member American Physical Society.

COLUMBIAN COLLEGE.

Professor of Greek and Latin: CHARLES SIDNEY SMITH, Ph.D.

A.B., Princeton University, 1888; A.M., *ibid.*, 1891; Ph.D., Johns Hopkins University, 1906; Graduate Student, Princeton University, 1888-'90; Assistant Master, The Dupuy School, Trenton, N. J., 1890-'91; Instructor in Latin, Princeton University, 1891-'97; Student in University of Leipzig, 1897-'98; Graduate Student, Johns Hopkins University, 1898-1900 and 1905-'06; University Fellow, *ibid.*, 1900 (resigned); Assistant Professor of Greek and Latin, The George Washington University, 1900-'07.

Instructor in Romance Languages: HENRI BAULIG.

Bachelor ès lettres, University of Paris, 1895; Student, *ibid.*, 1895-'07, 1898-1903; Licence ès lettres, *ibid.*, 1900; Diplôme d'études supérieures d'histoire et géographie, *ibid.*, 1901; Instructor in French, Harvard University, 1904-'07. American correspondent of *Le Journal des Débats* and *Annales de Géographie*.

Instructor in Botany: WALTER FISCHER, M.A.

B.S., Ohio State University, 1897; M.A., *ibid.*, 1905.

Instructor in German: WILLIAM B. SCHULZ, B.A.

B.A., Concordia College, 1894; Student George Washington University, 1905-'06; Catalogue Division Library of Congress, 1902-—.

Assistant in History: H. V. ARTHUR SCHOENFELD, A.B.

A.B., The George Washington University, 1907.

Assistant in Greek and Latin: M. WALTON HENDRY, A.B.

A.B., Johns Hopkins University, 1903; Instructor in Latin and Greek, Camden, N. J., High School, 1904-'06.

Assistant in Chemistry: WILLIAM E. HILLYER, M.S.

B.S., The George Washington University, 1899; M.S., *ibid.*, 1900.

COLLEGE OF ENGINEERING.

Assistant Professor of Civil Engineering: EDWIN V. DUNSTAN, C.E.

B.S., The George Washington University, 1905; C. E., 1906; Instructor in Civil Engineering, 1905-'07.

Assistant Professor of Civil Engineering: OSCAR A. MECHLIN, C.E.

B.S., Dartmouth College, 1903; C.E., The George Washington University, 1906; Assistant Engineer, District of Columbia, 1904-'06; Instructor in Civil Engineering, The George Washington University, 1906-'07.

Assistant Professor of Mechanical Engineering: ARTHUR CUTTS WILLARD, B.S.

B.S., Massachusetts Institute of Technology, 1904; Principal, University School, San Francisco, 1904-'06; Instructor in Mechanical Engineering, The George Washington University, 1906-'07.

Instructor in Civil Engineering: F. CHARLES STAER, S.B.

S.B., Massachusetts Institute of Technology, 1905; Assistant in Civil Engineering, *ibid.*, 1905-'07.

Instructor in Mechanical Engineering: JULIAN C. SMALLWOOD, M.E.

M.E., Columbia University, 1903; Assistant in Mechanical Engineering, *ibid.*, 1904-'05; Superintendent, Hammerschlag Construction Company, 1903; Designing Engineer, Standard Plunger Elevator Company, 1906-'07.

Instructor in Electrical Engineering: CHARLES W. MORTIMER, M.E.

A.B., Mississippi College, 1902; M.E., Cornell University, 1907; Principal, High School, Hebron, Miss., 1902-'04.

COLLEGE OF THE POLITICAL SCIENCES.

Professor of Political Science: WESTEL WOODBURY WILLOUGHBY, PH.D.

A.B., Johns Hopkins University, 1888; Fellow, 1890-'91; Ph.D., Johns Hopkins University, 1891; admitted to the bar, 1892, and practised law in Washington, D. C., 1892-'07; "Lecturer" then "Associate" then "Professor" and now "Professor of Political Science" in the Johns Hopkins University, 1895—; Managing Editor of the *American Political Science Review*; Secretary and Treasurer, American Political Science Association; and Editor of the *Johns Hopkins University Studies in Historical and Political Science*; Editor of the "American State Series."

Assistant Professor of Diplomatic History: WILLIAM RAY MAN-
NING, PH.D.

A.B., Baker University, 1899; Graduate Student, University of Kansas, 1900-'02; A.M., 1903; Fellow and Assistant in English History, *ibid.*, 1901-'02; Fellow and Assistant in European History, University of Chicago, 1902-'04; and Ph.D., 1904; awarded the James Wilson Prize of the American Historical Association for Ph.D. dissertation on the Alaska Sound Controversy, 1904; Instructor in History, Purdue University, 1904-'07; Member American Historical Association; Member American Society of International Law.

Professor of Finance: HENRY PARKER WILLIS, PH.D.

B.S., University of Chicago, 1900; Traveling Fellow, *ibid.*, 1897; Ph.D., *ibid.*, 1897; Secretary, Finance and Monetary Commission, 1897-'98; Professor of Economics, Finance and Law, University, 1898-1907; Editorial writer, *New York Evening Post*, 1900-'02; Correspondent and Editorial Writer, *New York Journal of Commerce and Commercial Bulletin*.

Instructor in Political Science: HOWARD LEE MCBAIN, PH.D.

A.B., Richmond College, 1900; A.M., 1901; Assistant Principal Richmond High School, 1901-'04; President's University Scholar in Constitutional Law, Columbia University, 1904-'05, 1905-'06; Winner of Toppan Prize in Constitutional Law, *ibid.*, 1905; Honorary Fellow in Constitutional Law, *ibid.*, 1906-'07; A.M., *ibid.*, 1905; Ph.D., 1907; Lecturer in Constitutional History, University of Virginia Summer School, 1905. Member American Political Science Association, American Academy of Political and Social Science.

Lecturer on the Consular Service: JOHN BALL OSBORNE, A.M.

A.B., Yale University, 1889; A.M., 1894; American Consul at Ghent, Belgium, 1889-'94; Joint Secretary of the Reciprocity Commission of the United States, 1894-'95; Chief of the Bureau of Trade Relations, Department of State, 1895- —

DIVISION OF ARCHITECTURE

Assistant Professor of Architecture: CHARLES MASON REMEY.

* Instructor in Architecture, The George Washington University, 1906-'07.

Assistant in Architecture: CHARLES R. LOMBARD.

DIVISION OF EDUCATION.

Professor of Philosophy, in Charge of the Division of Education:
WILLISTON S. HOUGH, PH.M.

Ph.B., Ph.M., University of Michigan, 1884; Student in the Universities of Heidelberg, Halle, Berlin, Paris, and Oxford, 1884-'88; Instructor in Philosophy, University of Michigan, 1888-'89; Assistant Professor of Philosophy, University of Minnesota, 1889-'91; Professor, *ibid.*, 1891-'94; research, Bodleian Library, Oxford, and Royal Library, Berlin, 1894-'98; Literary work, New York, 1898-1901; Florence, Italy, 1901-'02; London, 1902-'04; Professor of Philosophy, The George Washington University, 1905- —; Member, The American Philosophical Association, The South-eastern Society for Philosophy and Psychology.

Assistant Professor of Educational Psychology: WILLIAM CARL RUEDIGER, PH.D.

Diploma, State Normal School, Stevens Point, Wis., 1897; Ph.B., University of Wisconsin, 1899; Ph.M., *ibid.*, 1903; Ph.D., Columbia University, 1907. Teacher in Graded School, 1893-'94; High School, 1899-'02; Assistant in Pedagogy, University of Wisconsin, 1902-'03; Professor of Method, Montana State Normal College, and Assistant Superintendent of Public Schools, Dillon, Montana, 1903-'05; Fellow in Education, Teachers College, Columbia University, 1905-'06; Assistant in Psychology, Columbia University, 1906-'07.

Lecturer on Educational Theory: ELMER ELLSWORTH BROWN, PH.D.

Diploma, Illinois State Normal School, 1881; A.B., University of Michigan, 1889; Ph.D., University of Halle, 1890; Principal High School, Jackson, Mich., 1890-'91; Acting Assistant Professor of Science and Art of Teaching, University of Michigan, 1891-'92; Associate Professor of Pedagogy, University of California, 1892-'93; Professor, *ibid.*, 1893-'98. Professor Theory and Practice of Education, *ibid.*, 1898-1906; United States Commissioner of Education, 1906- —; Member, National Council of Education (Pres., 1905); International Congress of Arts and Sciences, St. Louis, 1904.

Lecturer on School Administration and on Educational Theory: **WILLIAM ESTABROOK CHANCELLOR, A.M., M.D.**

A.B., Amherst College, 1889; A.M., *ibid.*, 1895; M.D., Long Island Medical College, 1892; LL.B., Harvard Law School, 1895; Lecturer Brooklyn Institute, 1895-'96; Superintendent of Schools, Bloomfield, N. J., 1897-1904; Paterson, N. J., 1904-'06; Superintendent of Public Instruction, District of Columbia, 1906- —; Lecturer on Education, University of Chicago (Summer Quarter), 1907.

Lecturer on the History of Education and on Manual Training: **GEORGE EDMUND MYERS, Ph.D.**

A.B., Ottawa University, 1896; Student at the University of Chicago, 1899-'91; A.M., *ibid.*, 1901; Fellow in Education, Clark University, 1904-'06; Ph.D., *ibid.*, 1906; Teacher in Secondary School, 1896-'99; Teacher and Principal of High School, Colorado Springs, 1901-'04; Principal McKinley Manual Training School, Washington, D. C., 1906- —.

Lecturer on Child Study and on School Hygiene: **WILLARD S. SMALL, Ph.D.**

A.B., Tufts College, 1894; A.M., *ibid.*, 1897; Student at Tufts Theological School, 1894-'96; Scholar and Fellow in Education, Clark University, 1897-1900; Ph.D., *ibid.*, 1900; Honorary Fellow, *ibid.*, 1901; Professor of English, Lombard College; Professor of Psychology, Michigan Normal College; Supervisor of Training School, State Normal School, Los Angeles, Cal.; Superintendent of City Schools, San Diego, Cal.; Principal Eastern High School, Washington, D. C., 1906- —.

Lecturer on General Method and on Nature Study: **WILLIAM WESLEY BLACK, A.M.**

Diploma, Indiana State Normal School, 1892; A.B., University of Illinois, 1898; A.M., *ibid.*, 1899; Teacher in Elementary and Secondary Schools; Superintendent of Public Schools; Head Critic, Illinois State Normal School, 1900-'01; Head Critic, Chicago Normal School, 1901-'06; Supervising Principal, Washington, D. C., 1906- —.

Lecturer on Classroom Management: **STEPHEN ELLIOTT KRAMER, B.S.**
Diploma, Washington Normal School, 1890; B.S., The George Washington University, 1906; Instructor in English, Eastern High School, Washington, D. C., 1891-'92; Principal of Smallwood School, 1892-'99; Principal of Force School, 1899-1902; Principal of Franklin School, 1902-'05; Director of Night Schools, 1903-'05; Supervising Principal, 1905- —.

DEPARTMENT OF LAW.*

Assistant Professor of Law: **JOSHUA REUBEN CLARK, JR., LL.B.**
B.S., University of Utah, 1898; Acting Principal, Southern Branch of State Normal School, Utah, 1900-'01; LL.B., Columbia University, 1906. Member of Board of Editors, "Columbia Law Review," 1905-'06. Assistant Solicitor, Department of State, September, 1906.

* Announcement of appointments in the Faculty of Medicine is reserved for the December Bulletin, which will be devoted to the Departments of Medicine and Dentistry.

UNIVERSITY MISCELLANEA.

The Commissioners of the District of Columbia appointed as Delegates to the National Trust Conference which met in Chicago from October 22 to 25, President Needham, Messrs. Noyes, Edson, Jennings, and Woodward, of the Board of Trustees, and Professor Gore. The last named read a paper on "The Relations of Industrial Combinations to Export Trade," published in this number of the University Bulletin.

Professor Mitchell Carroll is one of the editors of the *Classical Weekly*, which is published as the organ of the Classical Association of the Middle States and Maryland. The first issue of this publication appeared October 5. The next meeting of the Classical Association will be held at the George Washington University in the spring of 1908.

Professor Henry Parker Willis, of the Faculty of Political Sciences, will deliver one of the principal addresses at the National Conference on Taxation, to be held at Columbus, Ohio, November 12 to 15. His subject is "The Relation of Federal to State and Local Taxation." Dr. H. L. McBain, of the same faculty, will address the Teachers Convention of Virginia at Richmond in November on the "Teaching of Civics in Schools and Colleges."

Mr. Charles M. Jesup, of New York, it is announced, will soon visit Washington for the purpose of addressing the students and organizing a civic league in this University, similar to the one he has organized in several of the large universities of the country.

Professor C. W. A. Veditz, acting dean of the College of the Political Sciences, gave a course of lectures in July at the summer school of the University of Illinois.

Dean Charles E. Munroe, Professor Frank Wigglesworth Clarke, and Professor Harvey W. Wiley, of the Faculty of Graduate Studies, were appointed on the Jury of Awards at the Jamestown Exposition, Dean Munroe being Chairman of the Jury on Chemicals and Allied Substances, and Professor Wiley being Chairman of the Jury on Foods.

George Horton, Esq., Consul General of the United States to Greece, who is a Doctor of Letters of this University, is now on leave of absence in this country and is on a lecture tour for the Archaeological Institute of America. The subject of his lecture is "The Greeks of Today." Dr. Horton will address the Washington Society of the Institute on November 20.

Dr. Theodore Gill, Professor of Zoology, attended the National Zoological Congress held in Boston last August. Dr. Gill went as the guest of the General Committee and was invited to deliver an address on "Systematic Zoology." Dr. Gill represented the United States under the seal of the State Department, the Smithsonian Institution, the Washington Academy of Sciences, the Biological Society of Washington, the George Washington University, as well as His Majesty the King of Siam. The Congress was attended by many distinguished naturalists from Europe, Asia, Australasia, and the Americas.

Professor James Brown Scott received the signal honor of being appointed Technical Delegate of the United States to The Hague Conference, which is still in session. Press dispatches indicate that Professor Scott has had an important share in the work of the Conference. He is expected to return to Washington about November 15, when he will resume work with his classes in International Law and Contracts.

Mr. Alfred Buhrman, an assistant in the office of the Clerk of the Supreme Court of the District of Columbia, has been appointed Clerk of the Moot Court to succeed Mr. J. W. Latimer, who will give up the active duties of the Clerk's office in order to take charge of a course in Commercial Law for the students in the College of the Political Sciences and in the Washington College of Engineering. Mr. Latimer, however, continues to be in supervisory charge of the work of the Clerk's office and will also occasionally serve as Judge of the Moot Court.

At the last annual meeting of the Association of American Law Schools, held at Portland, August 26-28, Professor William R. Vance, Dean of the Law Department, was re-elected Secretary of the Association.

Professor Edward S. Thurston was a member of the "summer faculty" of the University of Chicago Law School during the summer quarter just past, having charge of the subject of mortgages.

Superintendent William F. Chandler, M.A., Lecturer on Education, has just published through Houghton, Mifflin & Co. a vigorous, constructive discussion of educational problems under the title, "A Theory of Motives, Ideals, and Values in Education." Already widely known as the author of "Our Schools, Their Administration and Supervision," Superintendent Chandler has added to his reputation as an authority on educational theory and practice by this unusually fresh and able analysis of modern education in its relations to various other social institutions.

Elmer Ellsworth Brown, Ph.D., U. S. Commissioner of Education, Lecturer on Education, received the honorary degree of Doctor of Laws from Columbia University at the Annual Commencement, June 12, 1907. The other recipients of this honor on the same occasion were Charles Evans Hughes, Governor of New York, and Henry Fairfield Osborn, first choice of the Regents of the Smithsonian Institution for Secretary in succession to the late Professor Langley.

William C. Ruediger, Ph.D., Assistant Professor of Educational Psychology, has published in the "Archives of Psychology" of Columbia University, a treatise on "The Field of Distinct Vision." This work, based upon extensive experimental research, has important bearing upon certain educational problems related to the psychology of reading.

Williston S. Hough, Ph.M., Professor of Philosophy, has ready for publication a translation of Eucken's "The Problem of Human Life," a work which has attracted wide attention in Europe as the most original, vital and idealistic expression of the great present-day movement in philosophic thought, calling itself variously The New Idealism, Personal Idealism, Humanism, and Pragmatism. The book has passed through seven German editions, and is being translated also into French, Italian, and Swedish. In the latter part of the work, Professor Hough has had the assistance of Boyce Gibson, of London University, author of "Rudolf Eucken's Philosophy of Life," etc. The appearance of the work in English is expected shortly after the Christmas season.

Douglass B. Sterrett, B.S., 1902, the George Washington University, sends the following papers which he has written, and which are published by the U. S. Geological Survey: "The Production of Precious Stones in 1906." "The Production of Mica in 1906." "The Production of Monazite and Zircon in 1906."

Ernest Brown, M.D., George Washington University, has, in conjunction with Lafayette B. Mendel, published in the Journal of the American Medical Association the following: "The Rate of Elimination of Uric Acid in Man."

"Science" for August 30, 1907, has an analysis of the statistics for the doctorate degrees conferred by the American universities for the past ten years. This is one instance of many showing that the conditions under which these degrees are conferred are being carefully inquired into. During all these years the work of our Faculty of Graduate Studies has been under close scrutiny. A list of the forty-one

institutions conferring this degree is arranged in the order of rank and George Washington stands fifteenth on the list. From an analysis of the statistics of nineteen institutions it appears that the percentage of those admitted who have received degrees is about seven. From statistics recently prepared by Professor Munroe, Dean of the Faculty of Graduate Studies, based on the record of this faculty from its organization, it is worthy of mention that while four hundred and thirty-three candidates have been admitted here to candidature for the Ph.D. degree, of this number the degree has been conferred upon only thirty-four, or 7.8 per cent of the total. By this criterion we find that we stand in line with the best institutions.

Mr. Louis Cohen has been recently added to the Faculty of Graduate Studies as assistant professor of mathematics. Mr. Cohen was a graduate student of Columbia University and served as an assistant to Professor Pupin. He has done much research work under the auspices of the Carnegie Institution, and copies of several publications in which his results are recorded have been deposited in the University library. He will offer courses in the higher mathematics which are especially needed by advanced students in the physical sciences.

Columbian College is the center of an already large circle of university colleges and schools, all of them, with the exception of the college, the development of specialized scientific or professional aims in education. A college of self-culture is the centre from which schools of self-expression naturally spring. High thought and refined sentiment seek expression through the institutions of society, hence the college is the natural habitat of schools of medicine, law, political science, engineering, architecture, education; hence it is that when men would have all these flourish, they foster a college for personal liberal culture, and it is known by its fruits, for long ago such a college began to be called a college of arts and sciences.

The new year at Columbian College is specially notable for two things. First the great increase in the number of courses of study in important subjects, redeeming the pledge of President Needham at the annual commencement in June, that the strengthening and development of the educational work should be the first care of those having in charge the University interests, and second the opening of the Woman's Building, according better facilities for class instruction, dormitory privileges, and the college life of the young women of the College.

The new Woman's Building which is opened this fall is situated at 1536-38 I Street, about four minutes' walk from the main building of the University. The upper floors will be used as a college dormitory for women, and the first and second floors contain lecture rooms, re-

ception, committee, and dining rooms. College girls may obtain board and rooms in the building at reasonable rates. The Dean of Women has an apartment and office in this building and will supervise the appointments of the house and the College interests. The young women of Columbian College will have for the first time this winter an educational and social center of their own. For all this the University and the girls are largely indebted to the society of the Columbian Women, the ladies of which have raised money for furnishing the building and given much time and care to the furtherance of the project.

The Washington College of Engineering has entered upon the most successful session in its history. With its enlarged quarters in two of the six I Street buildings recently rented by the University and with three additional instructors, very decided improvements have been made in the courses of study. The I Street houses contain four excellent recitation rooms, four drawing rooms so connected by doorways as to be equivalent to a large room, a library, a student social room, rooms that can be assigned to advanced students for special work in drawing in connection with their theses, and offices for all members of the faculty. The dynamo laboratories and steam and gas engine laboratories are all in the main University building and their equipment is very satisfactory. The growing prestige of this department is shown by the large increase in the number of students.

The Division of Architecture is now housed in its new quarters at 1532 I Street, and has also experienced the advantages of its enlarged quarters. The architectural library through purchases and loans of important works by Professor Ash and Remy is in a far more satisfactory condition than ever before.

The faculty of the new College of the Political Sciences is this fall larger than ever before because of the increased scope of the work and the introduction of undergraduate courses, in addition to the graduate work previously offered. The new appointees, whose academic biographies will be found elsewhere in this bulletin, are: W. W. Willoughby, Ph.D., who is Professor of Political Science; Henry Parker Willis, Ph.D., Professor of Finance; William Ray Manning, Ph.D., Assistant Professor of European History; Howard Lee McBain, Ph.D., Instructor in Political Science; and Mr. John Ball Osborne, M.A., Lecturer on the Consular Service.

On the fifteenth of October the total registration of the new College was nearly forty, and of this number a large majority were candidates for the undergraduate degree of Bachelor of Arts. The new College

has a larger percentage of students who come to us from other institutions than any other college of the University. Among the newly enrolled members are graduates of Cornell University, Boston University, University of Wisconsin, Harvard University, Amherst College, the University of Costa Rica, the University of Virginia, and Williamette University.

Inasmuch as several students who have made application for admission have not yet reached the city, it is highly probable that the total enrollment will considerably exceed forty for the present year. This means, even if there should be no increase in the enrollment each fall that there will be a total enrollment of over one hundred three years hence.

The Division of Education, which was established by the Board of Trustees in the spring of the present year, has inaugurated its work at a favorable moment. There is now a considerable local demand for the collegiate training of teachers. The Washington Normal School provides a good short course, consisting largely of practice work. But a full college course, combining with the strictly pedagogical training, broad and thorough training in the arts and sciences, is also in demand; and the prompt response which the courses offered have met with on the part of the teachers of the District shows that the University is meeting that demand.

The Division of Education is housed at 1534 I Street. The accommodations include the office of the Professor in charge, a cloak room, and a department library, on the first floor; a recitation room, and a large lecture room on the second floor; a recitation room, two offices, and a photographic dark room, on the third floor; and four rooms *en suite* on the fourth floor to accommodate a psychological laboratory for experiments relating particularly to educational problems.

The teaching staff for the professional courses comprises two professors and six special lecturers. There are offered 27 undergraduate and graduate professional courses. In all probability the program will be extended before another year.

The Department of Medicine is responding handsomely to the new policy of making the school an institution for students who can give their full time to the work. It is interesting to notice that the number of students who have matriculated this fall for the full day course is more than half the total registration. It is also significant to notice the decrease of the number of students with other occupations. Beginning with this year the Department requires the student having but part of his time for study to take an extra year to obtain his degree. There are, therefore, two distinct classes of students, one the full-day class taking

four years, and one the part-day class, taking five years. Improvements have been made in the physiological laboratory. The histology laboratory has also been equipped with the necessary apparatus for beginning a laboratory course in embryology.

The National College of Pharmacy has recently established chairs of mercantile pharmacy and pharmaceutical jurisprudence, which are now in active operation. The first lectures were delivered on October 8. The faculty for the session of 1907-8 consists of eight professors and three instructors.

The practice of giving a large part of the instruction in the Law Department in the forenoon, which was last year inaugurated with the First Year Class, has this year been extended to the Second Year Class. A further extension will next year be made to the Third Year Class, when all of the undergraduate work in the Law Department will be on the full-day basis. Provision will, however, continue to be made for those students who are so occupied in the day time as to be unable to attend the morning lectures, although such students will be required to take four years for graduation.

It is gratifying to observe that already the reputation of this Department of the University has been distinctly enhanced in the world of legal education and scholarship by reason of this stand taken for thorough work and sound scholarship. It is also noteworthy that the principle of requiring a longer period for students who are employed a large part of the time, has gained very general recognition in the legal profession. Such a requirement is recommended by the American Bar Association's Committee on Legal Education, and will doubtless soon receive the sanction of the American Bar Association, and of the Association of American Law Schools.

While the completed registration will show only a slight increase in the number of students in the Law Department, yet there is abundant evidence that the difficult task of putting the Law School on a basis of full-day work shows substantial and satisfactory progress. The percentage of students who have come to Washington solely for the purpose of pursuing the study of law in the University has materially increased, and the character of the work in the class-room gives noteworthy proof of the better results to be obtained from the use of more scientific methods of instruction.

President Needham is now giving the following series of addresses at the University Assembly held regularly at noon on Wednesday of each week:

First Series—Ideals: What Ought We to Be? October 2—Self-sustaining; Equipment. October 9—Self-governing; Morality. October 23—Self-respecting; Personality. October 30—God-fearing; Religion.

Second Series—Methods: How Shall We Become What We Ought to Be? November 6—Instincts; Inherited Habits. November 13—Memory; Accumulated Capital. November 20—Imagination; The Studio; November 27—Reason; The Master Workman. December 5—Habits; a High Efficiency. December 11—Liberty; the Watchword. December 18—Service; the Goal.

Intercollegiate debating at The George Washington University continued during the last academic year to be as successful as in previous years. Last year three intercollegiate debates were held, as follows: With the University of Cincinnati, in March, the University of North Carolina, in May, and with Syracuse University in June, each resulting in a victory for the representatives of this University. The defeat of Syracuse University was our seventh consecutive victory in less than three years, and the complete record of the past five years shows that out of twelve debates, ten have resulted in victories for The George Washington University. This record, it is believed, is equalled only by Harvard University and the University of Wisconsin.

The fall convocation of the University was held on Wednesday morning, October 16, at 10.30 o'clock, in Belasco Theatre. The invocation was pronounced by Rev. W. C. Alexander, D.D. The address of the occasion was made by Dr. E. Benjamin Andrews, Chancellor of the University of Nebraska, who spoke on "Phlegm versus Frenzy in Some Current Discussions." An abstract of the address is published in this number of the BULLETIN. At the conclusion of the address the following degrees were conferred:

Bachelor of Arts, Albert Perkins Tibbetts, New Hampshire; Bachelor of Science, William Alexander Boyd, North Carolina; Doctor of Medicine, Arthur Compton, District of Columbia; Clarence Mazarine Dollman, Virginia, John Lee Grant, Virginia; Eben Wesley White, New York; Bachelor of Laws, Henry Palmer Alden, District of Columbia; Joseph McCarter Bowyer, Pennsylvania; Frank A. Law, Jr., District of Columbia; Henry Petingale Merrill, District of Columbia; Jackson Morris, Kentucky; William Thomas Peake, District of Columbia; Ora Herbert Roberts, Indiana; Eugene Washington Staples, Maine; Omar Jay Veley, New York; Frederick R. Whippler, District of Columbia; Master of Laws, Walter Allwood Sommers, New York; Master of Patent Laws, Fred Merriam Hopkins, Michigan; Arthur Minnick, Illinois. After the morning exercises a luncheon in honor of Chancellor Andrews was served at the Shoreham Hotel, to which members of the Board of Trustees and of the University Council were invited.

At the meeting of the Board of Trustees of the University held Wednesday afternoon, October 16, a committee to select a site for the University and to make a report to the Board in reference to the respective values of all available sites, was appointed. The committee is composed of President Needham, ex-officio, Commissioner H. B. F. Macfarland, chairman of the Board, and Messrs. S. W. Woodward, Hennen Jennings, H. C. Perkins and Justice T. H. Anderson. Among the sites which this committee will examine is the Dean property at the intersection of Florida and Connecticut avenues; the Sherman Barber tract, Fourteenth Street, north of Florida Avenue; the site at the intersection of Sixteenth Street and Columbia Road; the Woodley Park site; a site on Massachusetts Avenue west of the new Rock Creek Bridge, and a site in the neighborhood of the Congressional Library. As soon as this committee is ready to report the Site Fund Campaign Committees will at once renew their campaign for the completion of the \$200,000.00 site fund subscription to be made by the people of Washington, three-fourths of which is already in hand in good subscriptions.

The George Washington University Bulletin

DECEMBER, 1907

DEPARTMENT OF MEDICINE NUMBER

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* Died, October 20, 1907.

EDITORIAL NOTE.

THE GEORGE WASHINGTON UNIVERSITY BULLETIN is published four times a year, under the editorial supervision of the Board of University Publications, appointed by the President's Council. It is the purpose of the Council to make the BULLETIN an organ of the educational and scientific activities of the University. The University Catalogue constitutes one number. Others are devoted to information of special interest to the Alumni and patrons of the University. Scientific numbers are published from time to time containing contributions from instructors and graduates and information regarding books, monographs, and papers published by them under other auspices.

The present Scientific Number is devoted especially to the Department of Medicine, and a number of papers are presented from members of the Faculty and Alumni, most of which were read before the University Medical Society. It also contains notes bearing on investigations and researches being made by instructors in this department, announcements of recent appointments, and miscellaneous items of University interest. The Board desires to be kept informed as to the academic record, publications and professional appointments of instructors and graduates in all departments of the University. Communications may be addressed to the Chairman.

The thanks of the Board are gratefully extended to the Advisory Committee of the Department of Medicine, consisting of Dean Phillips and Professors Franz, Nichols, Richardson, and Yarrow, for their co-operation in the preparation of this number.

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The George Washington University BULLETIN

VOL. VI

DECEMBER, 1907

No. 4

PSYCHOLOGY AND THE MEDICAL SCHOOL.

By SHEPHERD IVORY FRANZ, Ph.D.,

*Professor of Physiology and Experimental Psychology; Psychologist,
Government Hospital for the Insane.*

No one can seriously consider the history of medicine and particularly the history of medical education during the ~~19th~~ century and fail to realize the wonderful advances that have been made in the preparation of young men and women to care for the health of the community. Not many years ago a few courses in a medical college, with some time spent as an apprentice to a practising physician sufficed to produce a doctor of medicine. At this time and for many years the work of the medical school was subsidiary to the practical observation of patients and the compounding of drugs. The medical school furnished the opportunity of dissection and a few lectures on general chemistry and materia medica. The school existed largely because it was a convenient place for the acquisition of knowledge of the structure of the body by laboratory (dissection) methods and it is not strange that the traditions of the schools at the time and for many years should have been anatomical.

With the advent of new subjects, but also because of the insistent, although perhaps unexpressed, demand of the public for better trained physicians, the medical course has been gradually extended and the apprentice part of medical education has given place to hospital experience, which is much broader than the experience to be gained from following the cases of one man. The new subjects that were introduced have brought about a change in the character of instruction. Although it was first contended that it was necessary to have laboratory instruction only in anatomy, the division of students into small sections and the requirement that each student should have immediate experience with each subject is now almost universally acknowledged. The change in courses and methods is most striking in the subjects that may be called functional. The anatomical tradition still remains predominant in a few schools, and in these the appearance of the body in gross and under the microscope is believed to be the most important part of the education of a physician.

Were we to inquire, even in the schools that retain the anatomical standpoint, what the duties and the functions of a physician or surgeon are we should undoubtedly find that, in spite of the tradition, the answers would indicate a change from the exclusive structural to a juster appreciation of the functional standpoint. The function of the physician and the surgeon is the same. He who has charge of the health of a part of the community has one aim whether he uses the methods usually called surgery or those called internal medicine. This aim is a physiological one, one dealing with the functions of the body almost exclusively. This aim is to get the sick well and to prevent the well becoming ill. The aim is to get the body that does not properly function to perform its functions better; to prevent the improper functioning of bodies that are now well. Whether a leg is to be amputated or a headache treated the aim, consciously or unconsciously realized, is to ~~make~~ the body perform its functions normally or more normally than when the treatment was begun.

As indicated above, there are several methods used to restore or to preserve health. In the schools the methods of surgery and administration of drugs have been taught exclusively. These methods have been emphasized because of the materialistic view of life and because the extra-bodily causes of disease are more easily understood. The intra-bodily causes of disease have been disregarded, and for this reason charlatans of all kinds have been able to flourish and to grow rich. Mountebanks and fakirs of pleasing address and with a persuasive tongue have been able to gather their greatest gains from, and often in return to cure the ills of, patients who have no known cause for their bodily disorders, and who have been too summarily turned off by regular practitioners of medicine.

This is not the place to discuss in full the causes of disease or the different methods that have been found useful for the relief of ills. At the present time I desire solely to emphasize the importance of keeping in mind the fact that there are some ills not yet correlated with bodily changes, that the causes of the conditions are often intra-bodily, and that neither medication nor surgical operations are indicated. These pathological conditions are now known to be matters for careful psychological study and treatment, not for symptomatic prescription.

Psychology has been defined as the science of mind. It is the careful study of everything mental, how the mind works, how it is affected by external agents, how it can be made to work in certain directions, how, in fine, it can be made to affect the body (the extra-mental part of the individual) for well or ill. It includes the study of the mind or mental states in all kinds of people and animals, and if mental states are to be found in plants and rocks it will include the study of the mental side of

the flower or the stone. The field of psychology is as broad as mentality. It embraces the whole domain of mental phenomena, but for our purpose here we need consider only a small part of the field, that in relation to human activities.

Each one appreciates that he has within himself or that he has as part of himself something that is called "mind." The thing that is called mind differs from most of the individual in that it is something that cannot be seen, felt or heard or appreciated by any other person through the medium of the senses. To oneself the mind, in other words, is immediately given, to others it cannot be sensed but can be only surmised and only mediately appreciated. Mental states are individual and are only directly known to and knowable by the individual having them. By a series of deductions we may come to the conclusion that another individual has mental states and from a long series of experiences we have come to judge fairly accurately from his words and actions what sort of mental processes a certain man has at a given time. From another series of observations and deductions it has become apparent that the mind is somehow dependent on the part of the body we call the nervous system.

Although it is generally admitted that the nervous system is the part of the body most intimately connected with mental processes, it is also understood that the action of a nerve cell is different from the sensation or the idea. Sensations and ideas are correlated with or coexistent with the changes in the nervous system, but the physical and the chemical changes in the cerebrum, for example, are different to the mental states. The physical phenomena differ from the mental in that the former may be measured in many ways, the latter little if at all. The physical differs from the mental also in that we know the former to be different kinds of energy more or less well known, whereas the latter, as Ostwald avers, may be some form of energy, the character and relationship of which are unknown and possibly unknowable.

The fact that psychology has to deal with the mental side of the life of an individual gives at once an indication of the place the science should hold in the medical curriculum. We depend upon the mental acuity and integrity of a patient for the information that will enable us to make proper diagnosis, and at the same time to understand the course of the disease. In many cases where the mental processes are abnormal this condition in itself is the means for diagnosis and the only means. In some diseases it may be possible to diagnose the condition from physical signs or without any information from the patient or from friends or relations. This is, however, possible in only a few of the diseases and even in these cases the external signs of internal conditions of a mental order, such as sensations of pain or feelings of discomfort, are most valuable in limiting the diagnosis to a few possible conditions.

Not only do we depend upon the mental condition, the sensations and the feelings, of the patient for information of diagnostic value, but the mental state or the mental attitude of the patient is of some help in prognosis. To mention only one example we may cite the condition of interest on the part of the patient. While not mentioned in many text books of medicine as of importance for diagnostic or prognostic purposes the signs of a patient's interest in and appreciation of the things that go on give many physicians an idea of the condition of the patient not to be obtained from percussion or auscultation or the thermometer. In the above I have purposely used the words many physicians. This is because there are some physicians who do not carefully or even casually observe the mental symptoms and concomitants of diseases. Most of these are recently graduated from the medical schools, who following accurately the instruction they have received look for all the physical signs but who, untrained in the observation and interpretation of mental signs, do not take into account the diagnostic and prognostic indications of physiognomy and general behavior.

In some diseases the mental changes and differences in behavior, which are indications of mental activities, are the only indication of abnormal functioning. In many of these cases, which have been grouped under the general term "insane," there are to be found no marked changes in the functions of the vital organs. The heart and the circulatory system, the intestinal tract and digestion, secretions and the secretory organs are normal. Even the nervous system, so far as it can be studied by the usual clinical means, is normal. Only the activity and the feelings of the individual may be changed. The patient may feel depressed and remain quiet. He may require many times the normal amount of stimulation to bring about normal activity, although he can and does feel as acutely as another individual we choose to call normal. Or, on the other hand, he may appear to be hyperexcitable, with an apparent increase in his motor activity, and he may be unduly sanguine, even joyful, about matters that would depress an ordinary normal man. In these individuals the physical changes accompanying the disease are so insignificant and so inconstant that they can not be considered to have more than a passing place in the condition. Preeminently, the disease is the change in the mental condition of the individual. It is a change in the functions that are termed mind.

For many years it was supposed that, owing to the brilliant results of the investigation of non-mental diseases by means of the microscope, the only means of determining the cause of the mental change in the insane would be by studying stained sections of nerve cells and nerve filaments. For twenty-five years this work has been occupying the

attention of the student of mental diseases and with a very small return in so far as the mental aspect of the diseases are concerned. In some types of mental disease nothing has been discovered in the cerebrum or other parts of the nervous system that can not be found in perfectly normal people. The anatomical study to correlate mental changes with supposed brain differences has been unproductive. This is so even in such conditions of the nervous system as paresis, where the cerebral and other changes are most marked. The structural changes in paresis have been followed to such a degree that we are able to understand why there are found in addition to the mental picture the functional neurological differences in the reflexes and voluntary actions but no one has yet explained why in this type of disease we so often find the feeling of well-being accompanying a condition of the body far from well. I shall not predict that in these cases we shall be able to explain the condition from purely psychological study, but it appears probable that more light will be shed on the problem by such investigations.

In all types of mental disease the functional, or, more restricted, the psychological, study has been taken up with energy during the past few years, and we are just beginning to understand the problems from the new standpoint. Mania and melancholia, the types in olden days of two opposite diseases, are now known to be one. Instead of having an increased mental activity the maniacal individual has been found to be slower than normal, and in this respect to approach the type of the melancholic who is evidently slow. He has no increase in mental rapidity or in mental power, but is less able mentally just as is his fellow patient, the melancholic. Hysteria is purely a mental disease. Dementia precox is a mental change in an individual which has not yet been found to have any changes in the cerebral cells. Even with our most advanced methods of brain research with microscope and microtome we are as far from understanding many of the diseases of the mind as we were twenty or more years ago, and only by careful mental examinations have we been able to unravel the tangle to some extent.

So far we have considered the place that psychology has in the observation of cases for diagnosis. It has also a prominent position, which it has not hitherto been granted, in the treatment of many disorders. The subject of the influence of mind over body is a popular one and one that has received a large amount of attention, but not from the medical profession. We all have had the experience or have seen others having the experience of relief from pain during a period of time filled with matters of interest and importance. When the attention had passed from the sensation of pain to other sensations and ideas, the pain for the time being ceased to exist, to return when

interest in the other things ceased. The introduction of a new element into the field of consciousness has, we may say, inhibited the old and so long as the new is in focus the old is out of focus. The presence of certain stimuli will prevent the appreciation of other stimuli given at the same time. In an extended form this is one of the most powerful of the psychic methods of treatment, the substitution of one mental state for another. This substitution may take the forms of amusement, instruction, travel, and many other occupations.

In some cases it is possible to produce a cure by substituting punishments instead of pleasant occupations. The use of the cautery on the spine or the application of an electric brush has been found to be of great assistance in the cure of conditions obstinate to all kinds of medicinal agents. In such methods suggestion plays a large part, and in some of the older popular methods it is the whole. Examples of the latter are the use of a placebo and bread pills. With all our knowledge of the finer anatomy of diseased tissue the placebo still remains one of the most powerful medicines in the hands of the physician who appreciates how and when to use it. And there must be added to the methods hinted at above that of suggestion in the hypnotic state. This is the mental method par excellence, and is to be used only on special occasions and after others have failed. By it almost anything may be done, from relieving some of the distress of asthma to changing the habits of wayward boys.

A careful perusal of the leading text-books of physiology will show that already in the medical schools psychology has a place. Disguised under the name of physiology, sensations and perceptions take the place of unknown physiological processes in discussions of the brain and the special senses. The formation of images on the retina is a part of physiological optics. The phenomena of contrast and color, as well as of the estimation of space and size are psychological. The sensations of tone are strictly mental phenomena, the vibration of the basilar membrane, if this is what happens in the ear, is physiological. Pain, touch, heat, and cold are sensations from we know not what in the skin. Smell and taste sensations are received from terminal organs of the activity of which we are ignorant. So it is in the cerebrum. We talk glibly of sensation and perception centers, of areas for associational processes, but while the psychological analysis has been carried to a correspondingly high degree of perfection we are almost as ignorant of the physiological cerebral processes as we were fifty or a hundred years ago.

It is to be seen, therefore, that psychology or psychological methods are of value for diagnosis, not only of mental diseases, but of the so-called bodily diseases. They are important also for determining the prognosis, and the psychological methods have, or rather should have,

an equal consideration with the other methods of medical procedure, the administration of drugs and the knife. Does this mean that there should be introduced into the already crowded curriculum of the medical school an additional course or courses? The answer to the question depends upon the relative emphasis that is already laid on the mental side of disease in the courses given in the schools. In some schools, the only reference to psychological matters is to be found in the courses of the physiological department. In a few, judging by the recent utterances of members of the faculties, some attention is now being paid to this hitherto neglected field. The answer also depends upon the character of the students. If the students on entrance have had some training in mental science, the practical application of the facts learned in college courses may be made easily, but it must not be forgotten that in most institutions courses in psychology are composed of material that has little or no known value in medical science and practice. There would be many advantages in having special courses in psychology for medical students, just as there are advantages in having special courses in physics or mathematics for students of engineering or architecture, or just as there are special reasons for having courses in Biblical and Patristic Greek for students of theology. The facts and principles of any given subject are the same regardless of what application may be made of the facts and principles, but in professional study and use certain facts and principles are more and oftener applicable than others. The facts and principles applicable in any work should hold a prominent place in courses designed for the preparation of the men who are to make the application, and for this reason special courses in psychology for medical students are desirable, perhaps necessary.

A course similar to the one outlined by Professor E. C. Sanford, of Clark University, with modifications to suit the needs of medical men, is the sort of a course in psychology from which not only every student but every practitioner of medicine would profit.*

Not the psychology of the anatomical elements of mind, sensations and their qualities, perceptions and perception complexes, attention and will, but the psychology of the mind as a whole and especially of the mind in its relation to every day life must be the subject of a course for medical men. Such a course should consist of lectures delivered by some one of large experience, who would take up among other things: the psychology of belief, of hypochondriasis, of illusions, hallucinations and delusions; the psychology of the crowd with its application to

* Professor Sanford's paper on this is well worth reading and digesting. Although he discusses the requirements of the subject for students in any branch of knowledge, his remarks are applicable to the medical school more than to any other professional college. E. C. Sanford, A sketch of a beginner's course in psychology, *Pedagogical Seminary*, vol. XIII, 118-124, March, 1906.

epidemics and especially nervous disorders; suggestion in its various forms and application; the expression and the interpretation of the feelings and emotions. In this series of lectures the dissection of the mind and the labeling of its parts have no place; terminology and definition are to the student of little import as compared with the grasp of the psychical point of view. Systematic psychological training may well be added, but the first requisite is that the student shall thoroughly understand the part that mind plays in the world as shown by the foibles and the disordered beliefs of the present and the past centuries. For careful appreciation and thorough understanding of the mental state of an individual more systematic knowledge is necessary, but only a few need have the special training. All should have the general training and the opportunity of acquiring the psychological attitude.

It has been said that all of us are psychologists in a very practical way, that we are psychologists in as much as we interpret the actions of our fellows in terms of our own mental make up, and that in so far as we interpret the actions rightly are we not only good psychologists, but also successful in our dealings with our comrades and dependents. It is upon the degree of the ability to interpret the actions of others properly that success depends. In none of the professions is it so necessary for the success of the practitioner to have accurate judgments made, in none do the comfort and life of the patient depend on this so much as in the profession of medicine. The daily attendance on patients, the meeting and consultations with relatives and friends require that the physician be an excellent judge of human nature, be in other words a successful and observing psychologist. Observation, diagnosis, assiduous attention, and the sending of bills have been said to be the main qualifications for a successful practitioner of medicine. All four require considerable insight into the mental characteristics of the patient and the family, all require the application of psychological principles to the matter in hand. One may well be a successful medical man without being able to define accurately what is meant by apperception, or belief, or consciousness, or the self. He has had experience that enables him to know a patient believes or apprehends certain things, but the understanding of the belief or of the apperception is to be gained by only long and weary personal investigation if the thoughts and experiences of others have not been drawn upon and made the basis for personal observation and deduction.

It is an old fallacy to say that each of us has a mind and that for this reason each one is able to observe and to record mental facts of value. It is just as unquestionable that each of us has a body and that we are, thereby, able to observe and to add to the sum of human knowledge about the body. Just in the way that we have some knowledge of the body, of the presence of lungs, heart, brain and bones,

have we knowledge of psychical things, of memory, attention, sensation. Without special training or long experience we are able to judge and value mental conditions about as well as we are able to construct anew the sciences of anatomy or physiology without the special training to be received in the laboratories devoted to these sciences and without the knowledge of the development of these subjects during the past. For the proper preparation of men to care for the health of the individual or the community some psychological training is necessary. He will be the most successful who has knowledge not only of the body and the action of drugs, but who also has knowledge of the action of mind.

The medical schools and the medical faculties must realize that they can not afford to permit students to pass through their medical preparation without at least a fundamental knowledge of the mental side of life. It is necessary, nay demanded of them, that the graduate be prepared to appreciate the power of the mind for health or illness, that he be given at least a view of mental conditions, mental signs, and mental therapeutics, and that he be prepared to treat the cases now turned over for exploitation, and often cure, by charlatans. It was one of our professional humorists, I believe, who wrote that if the Christian Scientists had more science and the doctors more Christianity, and if a patient had a good nurse his chances of living would be greatly increased. It is not Christianity the doctor needs, his daily life and good works show that he has the Christian spirit, but he does need the thing on which the Christian Scientist depends, a knowledge of or insight into mental states, in other words, psychology.

OBSERVATIONS WITH RESPECT TO TYPHOID
FEVER IN THE DISTRICT OF COLUMBIA.

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In one of the volumes of the report of the federal census of 1890, published in 1893, appeared the statement that during the six years ended May 31, 1890, the death rate from typhoid fever in the District of Columbia was 75.55 per 100,000, while the death rate from the same disease in a neighboring city, Baltimore, was but 40.17. A volume of the same report, published during the following year, showed that the death rate from the same disease in New York City was but 24.27, and the death rate in Brooklyn only 23.13. These figures, however, hidden away in the recesses of an official report appear to have attracted no attention, notwithstanding the fact that Dr. George M. Kober, in a paper read in Berlin, in 1891, before the International Medical Congress, had called attention to an outbreak of typhoid fever in the District of Columbia, beginning in December, 1889, and extending well into the spring of 1890, coincident with an outbreak of the same disease in Cumberland, Maryland, on the Potomac River, 174 miles above the intake of the Washington Aqueduct.

It was not until the evening of February 5, 1894, that Washington found itself stigmatized as a typhoid fever city, and the blame for such stigma placed upon the public water supply. On the evening mentioned, Dr. Charles Smart, of the Medical Corps of the United States Army, in an address before the Sanitary League, a popular sanitary organization that had sprung up as a result of the cholera scare which prevailed about that time, called attention to the excessive number of deaths from typhoid fever reported from year to year in the District of Columbia, and attributed them to the pollution of the Potomac River water, which, unfiltered, was being consumed for drinking purposes by the people of the District. The death rate from typhoid fever during the five preceding calendar years had varied from 80.4 to 110.5. These figures, however, alarming as they were, had attracted so little attention that Dr. G. L. Magruder, one of the leading physicians of the community, promptly took issue in the meeting with Dr. Smart's statement. On the following evening Dr. Magruder called the attention of the Medical Society of the District to the statements made by Dr. Smart, characterized these statements as purely misleading, and said that the experience of the practitioners of the city did not warrant any such conclusions. He moved that a committee of three be appointed to investigate the subject, and as a result Drs. G. L.

Magruder, W. W. Johnston, and C. M. Hammett, were appointed to constitute such a committee. Dr. Hammett was then the Health Officer of the District of Columbia.

The report of the committee just named was submitted to the Medical Society on June 6, 1894, and sustained all that had been said by Dr. Smart. The report called attention, among other things, to the fact that there were in use in the District 201 public wells, the number having been reduced from 289 since the year 1888, and to the existence within the city of 8,959 box privies and in the county of 5,133, a total of 14,092.* The report concluded with the following recommendations:

"The committee would urge upon the Medical Society the importance of taking the initiative in the effort to control the spread of this destructive but preventable disease by urging upon our municipal government, and upon Congress, the prompt adoption of measures to remove the causes to which this report has drawn attention.

"The measures to be recommended are:

"1. The immediate abandonment of all wells within the city limits, exception only to be made in case of the absence of the Potomac supply, and where the wells, after repeated chemical and bacteriological examinations, have been found to be free from all possible sources of danger. But even these to be abandoned as rapidly as possible.

"2. Purification of the sewerage system already existing, by replacing as rapidly as possible all damaged or defective drains.

"3. The introduction of new sewers in advance of other improvements in parts of the city not now supplied with drainage, and the extension of the system as far outside of the city limits as the rapidly growing population demands, so as to prevent soil contamination.

"4. The adoption of some system by which the lower sections of the city can be more completely drained and the risks arising from the backing up of tide water and sewage prevented.

"5. The final and safe disposal of the sewage.

"6. To make all existing privies, vaults, or other receptacles of human excreta water tight, and by rigid inspection and penalties to prevent the danger from leakage and overflow.

"7. The early completion of the plans recommended by Col. Elliot, in charge of the Washington Aqueduct, and now in course of execu-

* These figures may be regarded as a fair index of existing conditions, although their accuracy is, I believe, open to question. So with respect to the number of wells closed from year to year as shown in the appended table; the exact number closed each year has been difficult to ascertain, but there has been a general movement toward closing shallow wells until in May, 1907, the number existing was sixty-two, and these excepting nine were closed by Commissioners' order of May 21, 1907. The figures in the appended table showing the number of box privies abandoned from year to year are accurate, but it is difficult to tell the number now in existence. It is believed, however, that the number would not exceed 4,000 in the entire District.

tion, which have in view the sedimentation of the Potomac water, and ultimately the completion of works for filtration, the only proper method of purification.

"8. The suppression of all privies and the enforcing of the law to make sewer connections.

"9. Careful inspection of all dairies in the District from which our milk supply is drawn, and the enactment of a law by which no milk shall be sold in the District without a permit from the Health Office. The inspection should cover an examination at the dairies of all possible sources of infection, including the water supply.

"10. The urging upon the members of the profession of a careful collation of all facts bearing upon the mode of infection in each case, and the advantage of reporting such facts to the Society, and the propagation of the doctrine that immediate disinfection of the stools is the first duty of the physician as guardian of the health of the community."

Entirely without reference to any supposed effect on the prevalence of typhoid fever, action had been taken even before the report of the above named committee was made, to carry out some of the projects which the committee recommended. Under the provisions of the act of Congress of March 2, 1889, making appropriations for the expenses of the government of the District of Columbia, the President of the United States had appointed a commission to examine and report upon the system of sewerage existing in the District of Columbia, and to make such suggestions and recommendations for the modification and extension of the same as they deemed necessary or desirable, and the report of the committee had been duly submitted to Congress and printed. The use of the Dalecarlia receiving reservoir, a storage basin with a capacity of about 150,000,000 gallons, had been discontinued in 1888 because of the turbidity and impurities introduced by the Little Falls branch, from which a part of its supply was received, with the result, however, of diminishing the period of sedimentation of the general water supply of the city. The appropriation act of March 3, 1893, had provided for the improvement of this reservoir so that it might be restored to use. A bill providing for the better regulation of the milk supply of the District had already been introduced into Congress and was then under consideration by the Medical Society, whose advice with respect thereto the Commissioners of the District of Columbia had requested.

The Medical Society, however, with commendable promptness appointed a committee to submit to the proper committee or committees of Congress the report that had been made concerning typhoid fever, and on June 14 the report was submitted to the Committee on the District of Columbia of the House of Representatives and published

as an official document. During the same year, the officer in charge of the Washington Aqueduct, Col. George H. Elliot, Corps of Engineers, U.S.A., submitted in his annual report a lengthy statement relative to the filtration of the Potomac River water, in which he concluded as follows:

"It is expected that when the works of improvement required for restoring to use the Dalecarlia receiving reservoir shall have been completed, at the end of this fiscal year, the time during which the water may be "settled" before it is sent to the city from the distributing reservoir will be so much increased (it will be doubled) that the condition of the water as to color after high-water and freshets in the Potomac and its tributaries will be much improved, and that when the new reservoir near Howard University,* which is to contain 300,000,000 gallons of water, shall have been finished and brought into use, there will be but little to be desired in respect of the quality of our water supply."

Coincident with the inauguration of its work toward the improvement of the water supply of the city, the Medical Society had taken vigorous action toward the bettering of the milk supply. At the meeting held on June 13, 1894, the Society approved the draft of a bill to regulate the production and sale of milk in the District of Columbia, and submitted it to the Commissioners as a substitute for the measure that the Commissioners had referred to the Society. The bill, substantially as drafted by the Medical Society, became a law on March 2, 1895. No sufficient provision was made, however, for its enforcement, and, therefore, really efficient work under it did not begin until several years later. On July 26, of the same year, 1895, the Dalecarlia reservoir was put into use, thus increasing very materially the sedimentation of the Potomac River water before its distribution. Typhoid fever was, however, so prevalent during the summer of this year that, at the request of the Health Officer, Dr. Kober assumed the duties of special medical inspector to inquire into its causes. His report was submitted to the Health Officer under date of November 27, 1895, and concluded with the following recommendations:

"First. The immediate closing of every well in the District wherever a better water supply can be obtained.

"Second. The early completion and extension of all necessary sewers within the city limits, and the enforcement of the law to make sewer connections.

"Third. The abandonment of all box privies within the city limits and the enactment of more stringent laws for the prevention of soil pollution, together with a rigid, frequent, and systematic inspection of all box privies in the suburbs.

* This reservoir has since been named the Washington City reservoir.

"Fourth. The improvement of the Potomac water by means of filtering basins, and the extension of the water supply to the suburbs at the earliest moment practicable.

"Fifth. Such measures as may be necessary to improve the sanitary condition in the lower part of the city, along the Potomac and the Eastern Branch, looking to the reclamation of stagnant and polluted marshes, and the prompt disposal of the sewage.

"Sixth. The enactment of a law requiring notification to the Health Officer of all cases of typhoid fever and other infectious diseases in the District of Columbia, together with a rigid enforcement of the building regulations requiring the cementing of cellars and basements, to prevent contamination of the air from polluted subsoils, and the systematic inspection of dairies inaugurated by you.

"In the meantime, as a preventive measure I earnestly recommend to the public the thorough disinfection of the excreta from all typhoid fever patients and greater care on the part of those connected with the sick, together with boiling the water and milk supply."

The recommendations made by Dr. Kober were promptly approved by the Health Officer and forwarded to the Commissioners with the recommendation that the Health Department be provided with means for conducting at all times inquiries similar to the one which Dr. Kober had made, but relating not alone to typhoid fever but also to all preventable diseases. The Health Officer recommended further that in addition to the construction of filter beds to remove impurities which could not be prevented from entering the river, steps should be taken to reduce to a minimum the amount of such impurities, and that, to that end, the Potomac basin be surveyed with special reference to the then present and prospective sources of contamination of the public water supply, and with a view to the adoption of whatever measures might be possible to remove such sources and to prevent their recurrence. The death rate from typhoid fever, which, during 1894, had been 85.8, dropped in 1895 to 79.3.

On May 19, 1896, an efficient law was enacted providing for the enforced drainage of lots, including the abolition of box privies. As was the case with respect to the milk law, so with respect to the compulsory drainage act, no special provision was made for its enforcement. During this year, however, 800 box privies were abolished. Twenty-six public wells were closed and the death rate from typhoid fever fell from 79.3 to 53.7. During the following year, 1897, 973 privies were abolished, and two public wells were closed; and the death rate during this period fell to 45.7. It must not be presumed, however, that the diminution in the death rate was due to the abolition of privies or the closing of wells. The possible effect of the restoration to use of the improved Dalecarlia reservoir on July 28, 1895, must also be borne in

mind. And then as a factor calculated to offset any conclusions with respect to the cause of the diminution in the typhoid fever death rate are the facts that during the following year, 1898, the death rate rose to 67.5, that in 1899 it was 69.3, and in 1900, 74.5; and this notwithstanding the fact that during the years 1898, 1899, and 1900, 1429 box privies had been abolished and 49 wells closed, and, more efficient inspection having been provided for, 1402 inspections of dairy farms had been made.

On March 21, 1898, appeared a report issued by the Marine Hospital Service, showing the results of certain investigations which that organization had been making since the previous summer with reference to the pollution of the Potomac River. This report, prepared by Dr. J. J. Kinyoun, then Passed Assistant Surgeon, Marine Hospital Service, after presenting the facts that had been found, said: "The conclusion to be drawn from the above statements is that the Potomac is polluted with sewage to such an extent that it is a constant menace to the health of the inhabitants of the District of Columbia. This is not a new statement, but is made only to emphasize what is already well known." On June 30th, of the same year, largely as the result of the persistent agitation of the subject by the Medical Society, an appropriation was made for investigating the feasibility and propriety of filtering the public water supply of the District of Columbia. The result of these investigations was submitted by the officer in charge of the Washington Aqueduct, then Lieut.-Col. A. M. Miller, on March 28, 1900. Col. Miller reported that "the bacteriological results obtained showed that the Potomac water as delivered from the mains is, in times of turbidity and low temperature, dangerous to health by reason of the quantity of bacteria present," and concluded that "if Washington is to be supplied at all times with an unobjectionable water, the only recourse is the adoption of a system of filtration." Col. Miller recommended the adoption of mechanical filtration, to which recommendation the Medical Society and the community generally took exception and, as a result, the Senate Committee on the District of Columbia investigated the subject, taking the testimony of certain experts with respect to the relative merits of the two systems, and procuring a report from certain distinguished engineers concerning the matter. The report of the Senate Committee was submitted to the Senate on February 19, 1901, and, on March 1, of that year, the first appropriation was made for the construction of filters for the purification of the water supply of the District of Columbia.

On January 8, 1902, the Washington City reservoir was put into service. This was a new reservoir added to the water-supply system of the District, and had a capacity of three hundred million gallons. It added, therefore, materially to the period of sedimentation of the

public water supply, at least in certain parts of the city. In 1901 and 1902, 560 privies had been abolished, five public wells closed, and 3,222 inspections of dairy farms made. On January 8, the Washington City reservoir had been put into service, and on February 4, the law requiring the reports of all cases of typhoid fever had been enacted. Yet the death rate, which had fallen in 1901 to 56.4, rose in 1902 to 74.0.

The following year, however, it fell to 45.0 and during the next year, 1904, it fell to 43.8. On August 18, 1905, the first of the public filters was put into use, and others were put into service as rapidly as completed, so that by October 5, the entire water supply of the city was filtered. It was too late in the year to expect that the filtration of the public water supply would bring about a material improvement in the death rate for the entire twelve-month period, yet the community was somewhat disappointed when no improvement occurred even during November and December. But with the filtration of the entire water supply of the city, with the abolition during 1903-04-05 of 908 more box privies, the closing of seven public wells, and 11,124 inspections of dairy farms, it was confidently believed that the year 1906 would show some improvement. What then was the disappointment of the community when month by month passed without any diminution in the number of cases reported or in the number of deaths? During the year 1906, 197 more privies were abolished, eleven more wells were closed and 3,526 inspections of dairy farms were made. Regulations were promulgated on April 4, 1906, for the better regulation of the keeping and disposal of stable manure with a view to the diminution of the number of flies and the lessening of the likelihood of infection through that agency, and on April 24, a regulation was promulgated requiring candy, and similar foods, sold on the streets and other similarly exposed places, to be kept covered so as to prevent them from becoming contaminated by dust and flies. Yet when the year had rolled around and an account of typhoid fever mortality was taken, it was found that the death rate, which in 1905 had been 43.9, in 1906 was 49.6.

The close of the year 1906 was marked by the discussion of the water supply of the District, on November 7, by the American Society of Civil Engineers, and by the publication on November 8 of a report on the subject by a special writer for the Engineering News, Mr. T. E. Horton. On February 16, of the current year, the Public Health and Marine Hospital Service published an elaborate report, concerning the prevalence of typhoid fever in the District of Columbia, and during the same period the Geological Survey has published an account of the Potomac River Basin, which goes exhaustively into the subject of stream pollution. It can not be said, however, that anything new with respect to the cause of the undue prevalence of typhoid fever has been developed.

From what has been said it will be seen that the Health Department of the District of Columbia has had an unusual opportunity for investigating the causes of typhoid fever during a considerable number of years past. Not only has a large number of cases of this disease come under the observation of the Department and been investigated by its own representatives, but there have been available for study the results of several more or less independent investigations. It may not be inappropriate, therefore, in concluding this paper, to state in a summary manner some of the results and conclusions.

1. *Variations in Death Rates.*—The variations in the typhoid fever death rate from year to year from unknown causes are so great as to render it unwise to found any opinion as to permanent improvement upon figures for a single year, but a single rise in the death rate may be sufficient to prove the continuous existence of danger, potential at least. (See Table I.)

2. *Distribution.*—No evidence has been found to show that typhoid fever has been persistently more prevalent in any one part of the District than elsewhere.

3. *Race.*—Whether typhoid fever is or is not more prevalent among the colored population has not been determined. The colored case rate is, as compared with the white case rate, relatively low, while the colored death rate and percentage of fatalities to cases are relatively high. This may be due either to the fact that mild cases among the colored race escape observation, or to the fact that when the disease occurs death is more apt to follow, or to both of these causes. (See Table II.)

4. *Milk Supply.*—A connection between the distribution of milk from certain dairy farms and the occurrence of typhoid fever has been found in 2.6 per cent of 4,135 cases of typhoid fever apparently indigenous to the District, investigated between 1902 and 1906, inclusive. No evidence has been found, however, to show that the general prevalence of typhoid fever in the District has been due to the milk supply, or that the number of cases in the District fairly chargeable to the milk supply exceeds the number chargeable to the same source in other communities. (See Table III.)

5. *Oysters and Vegetables.*—No evidence has ever been found upon which any case of typhoid fever could fairly be attributed to the eating in the District of Columbia, of infected oysters, clams, or uncooked vegetables, and no facts are at hand to show that the supply of these articles in the District of Columbia is materially different from the supply in other places where typhoid fever is not so prevalent.

6. *Privies.*—No demonstrable relation has been discovered between the location of box privies and the occurrence of typhoid fever. Whether the very considerable diminution in the number of box privies

within the sewered portions of the District has or has not anything to do with the diminution in the prevalence of typhoid fever that has occurred in recent years, can not be demonstrated. (See Table I.)

7. *Water Supply. Public Wells.*—In no instance has it been possible to trace any case of typhoid fever to a public well, nor has it been possible to discover any grouping of cases about any public well. Whether the closing of a large number of public wells has or has not contributed toward the diminution in the prevalence of typhoid fever in the District of Columbia, which has occurred since 1894, can not be demonstrated. In two cases outbreaks were fairly chargeable to the infection of private wells. (See Table I.)

Public Water Supply.—That prior to the filtration of the public water supply, typhoid fever could be distributed throughout the District of Columbia by the contamination of the Potomac River at a point even so remote from the intake of our city water supply as 174 miles, is believed to have been demonstrated by the unusual prevalence of typhoid fever in 1889 and 1890, coincident with an outbreak of typhoid fever at Cumberland, Maryland, and the unusual prevalence of the disease in September, 1904, immediately subsequent to an outbreak at Mount Savage, Maryland. The fact, however, that the water supply of the District has been, according to accepted standards, thoroughly well filtered since October 5, 1905, without any subsequent diminution in the prevalence of typhoid fever until June, 1907, shows either that the continuous undue prevalence of typhoid fever in the District of Columbia prior to filtration was not due to the public water supply, or that accepted ideas with respect to the operation of a slow sand filter in its specific relation to the typhoid bacillus are wrong, or that prevailing opinion as to the period that ordinarily elapses between the ingestion of the typhoid bacillus and the onset of the disease is erroneous.

The number of bacteria per cubic centimeter in the public water supply since filtration seems to bear no relation to the prevalence of typhoid fever, except that the number is, in a general way, larger during those periods when the disease is least prevalent than it is at other times. A similar relation existed prior to filtration. The exact relation existing between the frequency of the finding of colon bacilli and the occurrence of typhoid fever can not be made out definitely from data at present in hand. The unusually large number of cases reported during January of the current year considered in connection with the unusual frequency of the finding of colon bacilli in the water supply in November and December of the past year, and January of the current year, suggests a possible relation between those two factors. So also does the unusual freedom of the District from typhoid fever during the past summer, when examinations for colon bacilli were altogether negative, as compared with the prevalence of the disease

during the summer of 1906 when colon bacilli were more frequently present. In undertaking to determine the relation between the finding of colon bacilli in the water supply and the occurrence of typhoid fever comparisons must be made only of such data as relate to corresponding seasonal periods. The fact that the amount of raw water ingested during the summer months is greater than during the cold season, renders the chance of infection through water, other things being equal, greater during hot weather. (See Tables IV & V.)

8. *Bacillus Carriers*.—Available evidence is not such as to justify the opinion that so-called bacillus carriers play an important role in the dissemination of the disease. Of 4,135 cases originating in the District of Columbia between 1902 and 1906, inclusive, only 7.3 per cent were charged to direct contact with known cases. Moreover, many of our typhoid fever patients must have been bacillus carriers for longer or shorter periods after they had recovered clinically and resumed their places in their respective households. Yet the occurrence of a second case of typhoid fever in the same house in which the first case occurred, but after the lapse of four or more weeks from the recovery of the first case, is of extreme rarity.

Although we are not able to point out the cause, yet there has been a great diminution in the prevalence of typhoid fever in the District of Columbia since, in 1804, agitation was begun for the sanitary improvement of the District of Columbia. Much still remains, however, to be done. To class such typhoid fever as now exists as "residual" typhoid or "prosodemic" typhoid avails us nothing. Nor is anything gained by attributing the undue prevalence of the disease to the fact that Washington is a "southern" city. Either typhoid fever is a preventable disease or it is not. If it is, let us prevent it. If it is not, let us say so and turn our attention to something where our efforts may bring some reward. Personally, I believe that all diseases are preventable even though we may not yet have found out how to prevent them, or, if we have found out, although we can not or will not pay the price of prevention.

The problem at hand is not one affecting Washington alone, or one affecting any other one of two communities. It is one affecting the entire country, which during the census year 1900 lost 35,379 of its people from this preventable cause. Let the United States then devote some of its millions to the study of the disease and to the dissemination of information with respect to it, so that the day of its eradication may be hastened. Let the government attack the problem of preventing diseases of human beings with the same earnestness and energy with which it has attacked the problem of preventing or curing diseases of the lower animals and of plants, in the same direct manner, and in the same liberal spirit, and in the end all will be well.

TYPHOID FEVER IN THE DISTRICT OF COLUMBIA.

TABLE I.—Showing what has been done to prevent typhoid fever, and the results.
(Cases and deaths from "typho-malarial" fever are included.)

Year	Inspection of dairy farms.	Public wells closed.	Private wells abandoned.	Typhoid Fever.				Remarks.
				Cases reported.	Deaths.	Death rate per 100,000.	Mortality death rate per 1,000.	
1880			172	218	95.6	23.15		Mar. 2. Commission on sewerage authorized.
1890			119	257	110.5	23.81		Dr. Kober's report of the Cumberland outbreak.
1891			106	195	80.4	25.16		
1892			72	217	85.8	25.36		Mar. 3. Appropriation for improvement of Dalecarlia reservoir.
1893			188	212	81.2	23.25		
1894		39	546	228	85.8	21.89		Feb. 5. Dr. Smart's address on water supply. June 6. Medical Society's report on typhoid fever. July 1. War Department's report on water supply, by Col. Elliot.
1895		47	875	216	79.3	21.33		Mar. 2. Milk law enacted. July 23. Dalecarlia reservoir put into use. Dec. 2. Health Department report on typhoid fever, by Dr. Kober.
1896		26	800	148	53.7	21.16		May 19. Compulsory drainage act passed.
1897		2	973	127	45.7	19.75		
1898		11	711	191	67.5	20.54		Mar. 21. Marine Hospital report on water supply, by Dr. Kinyoun. June 30. Appropriation for investigating feasibility and propriety of filtration.
1899	596	28	381	200	69.3	20.32		March 23. War Department's report on water supply, by Col. Miller.
1900	806	9	337	219	74.5	20.61		
1901	957	5	280	169	65.4	20.19		Feb. 19. Senate Committee's report on filtration. Mar. 1. Appropriation for filters.
1902	2265	0	280	1474	226	74.0	18.95	Jan. 8. Washington City reservoir put into service. Feb. 4. Law requiring reports of cases of typhoid fever enacted.
1903	3399	0	363	1055	140	45.0	19.09	Aug. 18. First filters put into service. Oct. 5. Entire water supply filtered.
1904	4002	0	268	1006	139	43.8	19.61	
1905	3623	7	197	1007	142	43.9	19.20	Apr. 4. Regulations governing keeping and disposal of manure. Apr. 24. Regulation promulgated requiring candy, etc., sold on streets to be covered.
1906	3526	11	197	1126	162	49.6	19.35	Nov. 7. American Society of Civil Engineers' discussion of water supply. Nov. 8. Engineering News' report on typhoid fever, by Mr. Horton.
1907								Feb. 16. Public Health and Marine Hospital Service report on typhoid fever. Mar. Geological Survey's report on the Potomac River Basin. May 21. All shallow wells ordered closed. May 31. Regulation promulgated, requiring stores to be screened. July 8 and 27. Nine shallow wells excepted from order of May 21.

TYPHOID FEVER IN THE DISTRICT OF COLUMBIA.

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TYPHOID FEVER IN THE DISTRICT OF COLUMBIA.

TABLE II.—Death rates per hundred thousand for white and for colored people from 1894 to 1906, inclusive.

(Deaths from "typho-malarial" fever are included.)

Death Rates.				Ratio white death rate to colored death rate.	
Year.	Whites.	Colored.	All.	From Typhoid Fever.	From All Diseases.
1894.....	80.2	97.5	85.8	1 to 1.21	1 to 1.73
1895.....	67.5	104.4	79.3	1 to 1.55	1 to 1.61
1896.....	49.4	65.0	53.7	1 to 1.34	1 to 1.65
1897.....	23.5	61.1	45.7	1 to 1.58	1 to 1.77
1898.....	52.1	100.9	67.5	1 to 1.94	1 to 1.69
1899.....	49.4	115.4	69.8	1 to 2.41	1 to 1.77
1900.....	64.0	97.8	74.5	1 to 1.53	1 to 1.72
1901.....	42.8	87.1	56.4	1 to 2.03	1 to 1.82
1902.....	71.5	79.7	74.0	1 to 1.11	1 to 1.86
1903.....	38.1	60.8	45.0	1 to 1.60	1 to 1.74
1904.....	25.5	63.4	43.8	1 to 1.79	1 to 1.73
1905.....	40.0	53.3	46.9	1 to 1.33	1 to 1.90
1906.....	35.4	84.2	49.8	1 to 2.38	1 to 1.85

DEATH RATES FOR 1906 IN STREETS AND ALLEYS, COMPARED.

	Whites.			Colored.		
	Streets.	Alleys.	Ratio.	Streets.	Alleys.	Ratio.
General death rate per 1,000.....	13.2	15.2	1 to 1.15	28.4	28.9	1 to 1.02
Typhoid fever death rate per 100,000.	39.8	57.5	1 to 1.44	55.7	42.0	1 to 0.75
Population.....	225,689	1,730		79,036	16,659	

TYPHOID FEVER IN THE DISTRICT OF COLUMBIA.

TABLE III.—Prevalence and cause before and after Filtration of Public Water Supply.

	1902 ¹ and 1903.	1904.	1905. ²	1906.
Cases reported	2129	1006	1007	1126
Deaths reported	298	141	142	162
Per cent of fatal cases	13.98	14.02	12.94	14.39
Case histories obtained	1027	892	973	1092
Cases infected outside of District of Columbia...	231	140	170	202
Cases of local origin	1606	746	803	890
Cause of cases of local origin :				
No. attributed to direct contact.....	140	56	55	51
No. attributed to milk.....	24	0	23	69
No. of unknown origin.....	1580	690	725	780
Per cent attributed to direct contact.....	8.22	7.51	6.85	5.73
Per cent attributed to milk.....	1.53	0.00	2.86	6.63
Per cent of unknown origin.....	90.21	92.49	90.29	87.64
Origin of drinking water used by local cases of unknown origin prior to onset of illness :				
Potomac water exclusively	1172	610	648	690
Potomac water in part	145	12	25	77
Well water.....	102	49	43	34
Spring water.....	27	18	8	9
Bottled waters.....	12	0	0	10
Melted ice	12	1	1	0
	1580	690	725	780

¹ Figures for "1902 and 1903" cover the period from the time when the law requiring cases of typhoid fever to be reported, enacted February 4, 1902, became practically operative, to the close of 1903.

² Entire public water supply, except well water, filtered since October 5, 1905.

TYPHOID FEVER IN THE DISTRICT OF COLUMBIA.

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TYPHOID FEVER IN THE DISTRICT OF COLUMBIA.

TABLE IV.—Relation between the number of bacteria in the public water supply and the prevalence of typhoid fever.

("Typho-malarial" cases and deaths are included.)

(Date.	Bacteria per g. c.		Typhoid fever.		Date.	Bacteria per g. c.		Typhoid fever.	
	No. of obser- vations.	Aver- age count.	Cases re- ported.	Deaths.		No. of obser- vations.	Aver- age count.	Cases re- ported.	Deaths.
1886.					1906.				
Jan.	2	3,774	.....	10	Nov.	25	27	80	14
Feb.	4	2,536	.....	5	Dec.	26	60	51	67
Mar.	5	1,210	.....	10	1908.				
Apr.	4	1,521	.....	8	Jan.	27	39	27	6
May.	3	1,069	.....	7	Feb.	24	16	21	4
June	2	348	.....	5	Mar.	28	19	18	5
July	2	255	.....	17	Apr.	25	22	35	4
Aug.	1	261	.....	26	May	27	17	44	10
Sept.	2	178	.....	18	June	26	17	58	9
Oct.	3	75	.....	16	July	24	26	181	21
Nov.	1	116	.....	12	Aug.	28	14	293	32
Dec.	2	967	.....	17	Sept.	23	14	150	20
1887.					Oct.	27	16	171	28
Jan.	3	882	.....	4	Nov.	25	12	82	19
Feb.			.....	4	Dec.	25	45	46	4
Mar.			.....	7	1907.				
1889.					Jan.	28	68	53	7
July	14	67	.....	10	Feb.	28	45	32	6
Aug.	15	269	.....	39	Mar.	30	64	25	4
Sept.	26	221	.....	30	Apr.	27	21	28	6
Oct.	25	137	.....	28	May	25	26	37	7
Nov.	25	431	.....	29	June	25	18	36	2
Dec.	15	597	.....	25	July	24	17	82	10
1900.					Aug.	31	17	191	18
Jan.	26	15,873	.....	17	Sept.	27	32	187	17
Feb.	22	9,232	.....	6					
Mar.			.....	8					
Apr.			.....	10					

Samples of tap water.

Samples from clear water reservoir.

TYPHOID FEVER IN THE DISTRICT OF COLUMBIA.

TABLE V.—Relation between the frequency of the finding of colon bacilli in the public water supply and the prevalence of typhoid fever.

("Typho-malarial" cases and deaths are included.)

Date.	Colon bacilli.		Typhoid fever.		Date.	Colon bacilli.		Typhoid fever.	
	No. of specimens examined.	Per cent containing colon bacilli.	Cases reported.	Deaths.		No. of specimens examined.	Per cent of 10 c. c. containing colon bacilli.	Cases reported.	Deaths.
1897.					1897.				
July		30		10	Jan.			27	6
Aug.		22½		18	Feb.	24	0	21	4
Sept.		70		20	Mar.	27	0	18	5
Oct.		70		13	Apr.	25	4	25	4
Nov.		40		10	May	27	0	44	10
Dec.		20		18	June	28	0	59	9
1898.					July	21	5	184	21
Jan.	Samples of tap water.	20		8	Aug.	27	4	205	22
Feb.		25		4	Sept.	25	3	155	20
Mar.				2	Oct.	27	4	171	22
Apr.				0	Nov.	25	3	82	19
					Dec.	24	3	46	4
					1897.				
					Jan.	25	12	52	7
					Feb.	22	0	22	6
					Mar.	25	0	25	4
					Apr.	25	4	22	6
					May	25	0	27	7
					June	25	0	25	3
					July	25	0	22	10
					Aug.	27	0	191	13
					Sept.	25	4	186	17

*The record does not disclose the size of the sample examined.

REFLEX NEUROSES WITH PARTICULAR REFERENCE TO EYE-STRAIN.*

By D. KERFOOT SHUTE, A.B., M.D.,

Professor of Anatomy and of Clinical Ophthalmology.

Reflex action plays a part of fundamental importance in physiology. It is also of very wide prevalence in the production and fixation, first, of abnormal physiological states, and, secondly, of morbid anatomical conditions. We are aware of the fact that often in the past and too often in the present, specialists in the various branches of medicine have unduly and unwarrantably, accounted for distant pathological conditions exclusively through abnormal states prevailing in the domain of their several specialties. The tendency of the present day is to permit the reflex pendulum to swing too far in the opposite direction and to ignore too greatly the extreme importance of reflex action in the production of pathological conditions.

In the female disturbance of the auditory centers is not uncommon in ovarian and other internal disorders.

The relation between aural and ocular derangements has recently been emphasized by Cleveland and Oliver and many of these relations are clearly reflex in character. The trifacial nerve supplies many filaments not only to the eye but also to the middle ear and in the latter location a close association exists between the sympathetic and cranial nerves. As a result morbid conditions of the eye may, by reflex actions, so interfere with the trophic conditions of the middle ear as to induce not only functional disturbances but even organic changes in the tissues.

It has been proved that dental caries may, by reflex action, produce not only a functional disturbance of the organ of hearing, but also an acute inflammation of the middle ear. The so-called "sympathy" between the ear of one side and that of the other, which was recognized long ago by Wharton Jones, Kramer and other writers, is the result of the reflex action of a diseased ear upon the other ear. This reflex action from one ear to the other leads at first to functional disturbance and then to atrophy. While in many cases it is dependent upon the decussation of the auditory fibers, it is also brought about by the associations of the auditory and sympathetic nerves. Recently Urban-tochitz has extensively investigated and written upon this subject. Aurists of experience tell us that inflammations of the middle ear have been caused by dentition. In children particularly a reflex otalgia occurs depending upon the eruption of molars or upon early dental caries. Dench in his work upon "Diseases of the Ear" says that a pathological condition in any portion of the body may produce within

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the organ of hearing not only alterations of function, but also certain visible changes. A ready anatomical and physiological explanation is that through a reflex stimulus from a distant part changes take place in the vascular supply through the action of the vasomotor nerves and that the aural phenomena are developed on account of capillary dilatation. As illustrations we may refer to the giddiness frequently encountered in disorders of digestion and due to the fact that the nucleus of the vagus lies so closely to the center of the vestibular nerve. In like manner may be explained transient attacks of impairment of hearing accompanied by subjective noises of an intense character due to the fact that the center of the vagus in the medulla oblongata lies very close to the nucleus of the cochlear nerve. Aurists teach us that tinnitus is of common occurrence as the result of a pathological condition of the pelvic viscera, of subacute gastritis, of constipation, etc. Likewise a moderate impairment of hearing may be due to visceral disturbances, particularly of the pelvic viscera. Aurists of large experience tell us that a reflex stimulus may cause so great a transudation of serum or blood within the tympanum as to cause a rupture of the membrana tympani; also that herpes occurs on the auricle as a result of reflex action. Hypersensitive areas may occur as the result of reflex action, in an otherwise normal external auditory meatus. A group of symptoms of rare occurrence is noted by aurists known as angioneurotic edema and which is entirely of reflex origin. This edema is accompanied by exquisite pain and tenderness. Should the angioneurotic edema accompany a simple and otherwise uncomplicated acute middle ear inflammation it would constitute a pseudo-mastoid disease and might easily lead to the diagnosis of true mastoid disease, and the performance of a useless surgical operation. Dench states that all reflex aural disturbances, particularly those of a painful character, are most frequently met with in females of a neurotic or hysterical type. So much for the testimony of aurists as to the importance of reflex action in inducing functional and organic diseases of the ear.

Rotch, in his work on Pediatrics, says that the twitching and a certain amount of discomfort and fever which occur in children, at the time when a tooth is the apparent cause, should be referred to as a significant illustration of nervous phenomena from reflex causes. He says further that convulsions of a reflex nature occur at this time, and cease when the tooth has assumed its place above the margin of the gum. The rythmical oscillation of the eye-balls known as nystagmus occurs occasionally as a congenital disease and may persist throughout life. Sometimes it is dependent upon organic disease of the brain, such as meningitis and hydrocephalus, multiple sclerosis, cerebellar abscess and tumor, and again may arise from local diseases of the eye. In many cases this condition is induced reflexly from various peripheral

stimuli and is not, according to Retch, a very uncommon symptom in young children. He states that he has notes of two cases, brothers, who during the dental period showed this oscillation of the eyeballs with no other symptom. He states further that gyrospasm (rotary movements of the head) and spasmus nutans (nodding) are peculiar movements of the head in young children which are apparently of a reflex origin and are at times associated with nystagmus and strabismus. He states further that the chief causes are idiocy, rachitis, gastro-enteric irritation, and dentition. Nothing illustrates more forcibly the reaction of medical thought and practice, than the attitude of the medical profession towards gum-lancing. It was erroneously believed in former times that almost every disease which occurred in early life was due to dentition and gum-lancing was practised indiscriminately. Now at the present time, an almost equal amount of indiscrimination is displayed in refusing to do any gum-lancing at all. There are well-defined and indisputable clinical facts that positively demonstrate the value of gum-lancing in certain judiciously selected cases, and by this gum-lancing certain very grave reflex symptoms are immediately relieved. No ophthalmologist has ever claimed the indiscriminate influence of eye-strain over other portions of the body that the older pediatricists claimed for dentition over all the ills of childhood. Not even that much misrepresented and misunderstood, though level-headed and distinguished ophthalmologist, Dr. George M. Gould, has made a tithe of the claims for eye-strain that the older writers on the diseases of children made for dentition, and which the medical public so gullibly accepted, while now they so irrationally reject so large a part of the extremely valuable teachings of Dr. Gould. I am profoundly convinced, from fifteen years' practice in ophthalmology, that if the general practitioners would give heed to the invaluable teachings of Dr. Gould, untold suffering would be banished from thousands and thousands of people. The writer is convinced that the reflex ocular neuroses are much more extensive and important than the general practitioner is aware of and he has therefore thought that it might prove interesting as well as instructive to present the subject to this distinguished body in a brief and conservative manner. All physicians are aware of the fact that eye-strain will produce severe headache for instance, but many are not aware of the fact that there are many other serious results that follow eye-strain, such as insomnia, petit chorea, in children, vertigo, stomach derangements, impaired general nutrition, etc.

Slight errors of refraction, frequently dating from birth, often have a gradual injurious influence upon the nervous system, similar to the dropping of water upon a stone. The incessant impacts of reflex irritations upon the nerve-centers from any organ—eye, ear, ovary, tooth,

or what not—often lead to the over-leaping or shunting of these irritations to neighboring or more remote nerve-centers; and we thus have a perfectly rational anatomical and physiological basis for many otherwise obscure reflex neuroses. Whereof these reflex irritations are constantly occurring in persons of sensitive, highly-strung temperament, the wonder is, not that reflex neuroses occur, but that they are not more frequent. As a matter of fact these reflex neuroses are much more common than is generally supposed.

Eye-strain, productive of reflex neuroses, is of two types, viz., (1) Accommodative (due to ametropia or anisometropia) where the intrinsic ocular muscle—the ciliary muscle—is attempting to overcome low grades of astigmatism, hypermetropia, etc. (2) Muscular (due to heterophoria) where the extrinsic ocular muscles are in a condition of imbalance.

Probably in the great majority of cases this imbalance of the extrinsic ocular muscles is due to the low grade errors of refraction. At the beginning it is very important to emphasize strongly the fact that eye-strain is very commonly the cause of serious reflex neuroses, in children and adults alike, when no complaint is made whatever about the eyes, and when vision both for distance and near objects is perfect. Many physicians think that, because a patient has a vision for distance which is 20/20 (6/6) or can read easily Jaeger type No. 1, at 33 centimeters (13 inches), he has normal eyes. It cannot be emphasized too strongly that this is a very serious error. Moreover, under the above circumstances even a trained ophthalmologist can never be certain that a person under 45 years of age has normal eyes without the use of a cycloplegic. While many people suffer greatly from small errors of refraction, and from muscular imbalance, there are others who have no bad effects whatever. A sufficient explanation for this exists in the difference of general health, vocation, temperament, and environment in different individuals.

The reason that low grade errors of refraction cause so much trouble while high grade errors commonly do not is because, in the former cases, the ciliary muscle, by unequal and irregular contractions, can overcome the effects of the refractive error and so cause eye strain, but in the high refractive errors a compensating irregular contraction of the ciliary muscle cannot occur—hence the absence of eye-strain in the latter cases.

An extremely interesting group of reflex ocular neuroses are those where we find nervous or sick headache and general nervous symptoms, such as insomnia, irritability of temper, nausea, vomiting, facial chorea in children, etc., and constituting a symptom complex which can be entirely relieved by the correction of an error of refraction which throughout life had been the unsuspected cause of much suffering.

There are other cases in which the ocular defect leads to a tense post-ocular pain shooting back to the occiput and nape of the neck, and down the spine, even radiating to the shoulders and arms. There are other cases recorded by skilled and experienced ophthalmologists where great pain in the region of the heart, and which caused great anxiety, was entirely relieved by correcting an astigmatism against the rule and by a tenotomy for a hyperphoria (Risley). Many patients ascribe their symptoms to hunger, biliousness, and overfatigue, heredity and many other things, except the true cause, viz., eye-strain. One of the most striking things in ophthalmology is the constant handing down from parent to child of compound hypermetropic astigmatism with, therefore, headaches which are supposed to be hereditary and incurable, where a pair of glasses would entirely cure the headache and accompanying reflex neuroses. Many cases like the following occur in the literature of ophthalmology. A professional man (physician) suffered from almost constant occipital pain, was in despair on account of insomnia, considered himself a chronic dyspeptic, and for many years was in constant terror because of his insomnia, and premonitions of impending calamity. He had consulted many colleagues in different cities without lasting relief. He was finally advised to take a long sea voyage on a slow sailing merchantman. He had left home a "nervous wreck" and had returned after six months much improved in many ways. But as soon as he entered upon his work as a rhinologist all of his old symptoms speedily returned. He had normal acuity of vision and no subjective ocular symptoms. There was a low grade of astigmatism, a tendency for the two eyes to converge, and a tendency of the right eye to deviate upwards. As soon as the refractive error was corrected by glasses, and the vertical deviation of the right eye relieved by an operation, all of his symptoms promptly vanished, not only the headache and insomnia, but also the dyspepsia. He ate with impunity, the morning following the operation, a hearty breakfast of sausage, buckwheat cakes, and coffee, and continued with impunity to eat anything he desired for years afterwards. His general health improved and he continued his work ever since with entire comfort (Risley).

Not only is insomnia caused by eye-strain, but also the very contrary condition such as great drowsiness.

The cause of what the English call "Academy headache" (sightseers' headache") has been attributed by Simeon Snell of Edinburgh to throwing the gaze above the horizontal line, especially without a corresponding uplifting of the head, thus straining the elevators of the eyes. Any one watching visitors to a picture gallery will observe how often the eyes must be turned upwards to see the pictures that are hung above the level of the head. Certain cyclists suffer from this Academy headache when they lean on the handle bars with the head

lowered. The nystagmus of miners is supposed by Snell to be due to the weariness of the elevators of the eyeballs brought about by their constant turning upwards of the eyes with their bodies in very constrained positions.

Dr. Gould has written most instructively and entertainingly upon the optic and ocular factors in the etiology of the scoliosis of school children. He has shown conclusively that astigmatic children with unsymmetric oblique axes (especially in the dominant eye) develop a compensatory curvature of the spine on account of the habitual lateral inclination of the head. This physiological sciosis may readily degenerate into a pathological and organic spinal curvature. It seems to the present writer overwhelmingly reasonable that orthopedic surgeons in these cases should be careful to eliminate the factor of eye strain.

The use of emmetropic eyes under improper physical posture, unhygienic conditions of light, unusual direction of line of fixation, will cause asthenopia (painful sight), and reflex neuroses in healthy individuals; how much more, therefore, will abuse of the eyes produce reflex neuroses in those who are infirm from any cause or who have ametropia!

There are a number of able, successful and widely experienced ophthalmologists who teach that true chorea and true epilepsy may, under certain circumstances, be made worse by eye-strain, and may even at times be developed by this factor. I will not enter upon the controversy now or quote the authorities for and against the proposition. The last word has by no means been said upon the subject. Any widely experienced ophthalmologist will tell you that he has seen epileptiform convulsions and choreic movements abolished by the relief of eye-strain. All that the conservative ophthalmologist advises is that when you have to deal with obscure nervous affections, with epileptiform convulsions, various choreic movements, "habit chorea", vertigo, nausea and vomiting, pain over the mastoid region (pseudo mastoid disease at times), pain in the right inguinal region (possibly pseudo appendicitis), obscure pains over the heart, torticollis and spinal curvature, migraine, hysteria, neurosthenia, apparently stupid children, incorrigible children and adults, insomnia, great irritability, extreme depression, impaired memory, difficulty of concentration of thought, apprehension, lack of self-confidence, exhaustion and weariness, and the like, as well as headache, it may well be worth your while to eliminate the factor of eye-strain. No harm can possibly be done, and on the other hand every good may be accomplished. As Gould has so ably and brilliantly insisted, eye-strain is a factor of tremendous importance in modern civilization. It will well repay you as general practitioners to read his delightful Biographic Clinics. In my judgment, and from my experience, they teach vastly more that is true than is erroneous. In my judgment Gould has done a vitally important work

in reviewing the earlier writings of Thompson and Weir Mitchell, and insisting upon their great importance, and he has done an immense amount of first class work himself by his scholarly and able writings. When a child is removed from school on account of physical or mental disability, when the professional man is taken from his books and his work, when the skilled artisan must abandon his duties on account of disabilities, when the literary man and woman are unable to continue their chosen activities, it is all very well to insist upon the importance of rest, out-door exercise, recreation, change of scene, and climate, tonics, massage, and such like—they are all of great value. But they will not cure reflex neuroses due to eye-strain. Discriminating students of biography and experienced ophthalmologists know that when these persons resume their routine duties and vocations only too often the old distressing complex symptoms return. They know also that frequently in these persons eye-strain is found when it is looked for, and complete relief frequently follows the correction of an error of refraction or a muscular imbalance. The eyes are so extremely complex, they are so intimately related to the central nervous system (the retina is actually a portion of the brain), each eye is supplied by five out of the twelve cranial nerves not to mention the sympathetic nerves, they are so absolutely essential not only to the well being and happiness but even to the life of the individual, they are so increasingly being used, in our comparatively brief modern civilization, for near work of increasing difficulty, whereas for ages and ages before, they were mostly used for distant observation, that it is incomprehensible to me why they should be so wantonly abused and non-safeguarded.

Every child on entering school ought to have its eyes examined carefully under a cycloplegic. Every person wearing glasses ought to have the eyes examined every year or two. Every person developing symptoms which may possibly be of a reflex character referable to the eye, would be better treated by eliminating the possibility of eye-strain. Nor would I have it understood for a moment that I am endeavoring to put the eye upon a pedestal of exclusive importance from the point of view of reflex neuroses. Reflex neuroses occur from many other portions of the body when diseased as I have indicated in the earlier portion of this paper. The writer is simply an ophthalmologist and for this reason he deliberately chose for the earlier part of this paper illustrations of reflex neuroses from Otology and Pediatrics. In this paper he has simply wished, as an ophthalmologist speaking to general practitioners to emphasize the very great importance that he attaches, from his reading and his personal experience, to eye-strain as an important factor in many painful and distressing and often obscure reflex neuroses.

HOSPITALS AND ASYLUMS OF EUROPE.

BY WILLIAM A. WHITE, M.D.,

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During the past two summers I have taken my vacation trip abroad, and on each trip have taken occasion to visit a number of hospitals, particularly hospitals for the insane, and these latter I inspected as thoroughly as the circumstances and the time at my disposal permitted. During the summer of 1906 I visited in all twenty-four hospitals, viz:

In or near Paris I visited La Bicêtre, La Salpêtrière, Bourneville's Institution for Feeble-Minded Children, the asylum at St. Ann, and the asylums at Villejuif and Charenton.

In Belgium I visited the Colony for the Insane at Gheel.

In the German Empire I visited the Provincial Asylum at Bonn, the asylums at Heidelberg, Frankfurt, Giessen, the Psychiatric Clinic at Munich, and the new asylum near Munich, Egglefing. Near Berlin I visited Hertzberg, the Institution for Epileptics, Wuhlgarten, the new institution now building at Buch, and the new Tuberculosis Hospital at Buch. At Vienna I visited the General Hospital (Allgemeines Krankenhaus), and the Asylum. At Prague I visited the General Hospital (Allgemeines Krankenhaus) and the Psychiatric Clinic.

In London I visited the Bethlehem Hospital, the Claybury County Asylum, and Guy's Hospital.

In regard to all of these institutions I may say that the problem of insanity is very much the same the world over, and has been solved in general in the same way. The institutions of the different countries differ largely in matters of detail, which of course are more or less dependent upon purely local conditions. In none of the institutions, however, did I see evidences of the amount of liberty which is so conspicuously a feature of the American hospitals. For instance, they were all surrounded by walls, and seemed to adhere very strictly to distinct rules as regards hours of visitation, etc., there being apparently very little effort made to accommodate friends or relatives at other times.

In all of the institutions except those in France there is the single-headed management. In France, however, there is a business head of the institution, and I must say that these hospitals appeared to be among the least well conducted of any that I saw. The medical director oftentimes either lives away from the hospital or spends but a small portion of his time there, the several medical services being to all intents and purposes separate institutions and having little organic connection.

In the French institutions I saw some evidences of mechanical restraint, although at St. Ann the physician with whom I made rounds, Doctor Simon, told me they used absolutely no restraint whatever. This is very commendable, as it is the central receiving hospital for Paris, and Doctor Simon told me that they had 2,000 admissions per annum on the female side alone. In France, however, as on the Continent generally, many patients are sent to hospitals for the insane who perhaps would not be in this country. There are no tedious legal formalities required for commitment, and patients generally who show mental symptoms are sent to the asylum. This includes each year quite a considerable number of cases of alcoholism.

In Germany there is a great deal of activity along psychiatric lines, and considerable progress is shown in the problems of construction of German institutions. It is noticeable that in practically none of the hospitals abroad are the buildings over two stories in height, whereas in this country we have only recently come to realize the desirability of putting up two-story buildings. They have evidently been building their hospitals two stories high for a long time. The old Bicêtre and the Salpêtrière have no buildings higher, while the general hospitals in Vienna and in Prague are of the same two-story construction. This maintains in practically all of the institutions that I saw throughout Germany.

The German institutions are all well built, although some of them now are getting rather old. They are all approximately the same size, accommodating from twelve to fifteen hundred patients. The Germans seem to think that larger institutions are not desirable, and when their institutions become crowded instead of adding buildings to already established hospitals they build new institutions. This results in giving a finished appearance to each hospital and it does not become necessary for a superintendent to be everlastingly endeavoring to remodel his institution to accommodate a constantly increasing population. The new institutions in Germany, however, are most exquisitely built, apparently almost regardless of cost. The Psychiatric Clinic at Munich was built by the University, and is intended to accommodate only 120 beds, and cost 2,000,000 marks. (\$500,000). That is \$4,000 per bed. The institution now building at Buch is to accommodate 1,000 patients, and to cost when completed 13,000,000 marks. This is something over \$2,000 per bed, which, considering the cheapness of labor and the general cheaper cost of construction in Germany, is to say the least a very liberal allowance as compared, for instance, with the Government Hospital, the new extension of which cost less than \$1,500 per bed. This institution is composed of two classes of buildings—large buildings for the more strictly chronic and custodial class of insane accommodating about 100 beds each, and smaller cottages accommodating 25 to 30

patients. There are also accommodations for the criminal insane, for there, as elsewhere, there appeared to be no institution for criminal insane, each hospital taking care of the criminals in its district.

The great care that is shown in details of construction is well illustrated in the building of the wall about this hospital. All of the large hospital buildings are built in the form of a rectangle, the wall merely connecting the buildings. This makes it only necessary to construct a sufficient amount of wall to occupy the space between the buildings, the ends of the buildings themselves filling in the interval. Besides this the ground is graded away from the foot of the wall for a considerable distance, so that a little way off the wall itself is hardly noticeable. This method of construction has been still more fully carried out at the new asylum (Mauer-Oehling) just outside of Vienna, which unfortunately I did not have time to visit. Here the ground is graded both inside and outside so that the wall itself merely sets in a depression, its top being on a level with the ground on each side. Hedges are then planted along on each side, making the wall quite invisible from within or without.

The new institution near Munich, Egelfing, is perhaps the most beautiful and the most complete in structural detail of any of the Continental hospitals for the insane. It was built to accommodate 1,200 patients, and they have almost that number there now, and cost between 8,000,000 and 9,000,000 marks, or in the neighborhood of \$1,700 or \$1,800 per bed. This is a beautifully situated hospital in the center of an immense valley of excellent farming land, and consists of about 60 buildings entirely upon the cottage plan, small cottages built to accommodate anywhere from 25 to 40 patients. They are all completely equipped in every detail and the architecture is of an extremely pleasing type. Practically everything has been done to make this institution complete in every detail. All the cottages are connected by a complete system of tunnels, and the most thorough sanitary provisions have been installed throughout.

At the asylum at Heidelberg I was particularly struck on entering to see a class of army surgeons assembling for a lecture on psychiatry. It is true that since the establishment in Washington of the Army and Navy Medical Schools that the students have been sent to the Government Hospital for the Insane to attend the course of lectures on psychiatry given there each year. The instruction of the army and navy surgeons abroad, however, along psychiatric lines is much more thorough than in this country. Surgeons are detailed from the service to serve as assistants in the various hospitals for the insane and in that way gain an experience impossible to get in any other way. Actual contact with the insane is absolutely essential to the understanding of their condition, and, aside from its general educational advantages it should

be fostered, for by this means alone can the enlistment of mental defectives be reduced to a minimum. This matter is appreciated abroad as instanced by several papers on the subject that have recently appeared in the foreign literature. The men thus detailed to the hospitals for the insane often do excellent work and I have met them in the laboratories and clinics and noted their names on the programs of scientific meetings. We would do well to follow the suggestion of the European countries in this matter.

In both Buch and Egelfing the isolation room is largely used and most admirably constructed. The windows are either located out of reach of the patient or else are made of heavy glass in small panes set in steel sashes, so that the room can be thoroughly lighted, and yet there be very little possibility of a patient being able to obtain broken glass with which to injure himself. In some institutions, too, especially in the Psychiatric Clinic at Munich, I found all of the telephones, electric-light fixtures, water-faucets, and apparatus for raising and lowering transoms located within cupboards set in the wall and inclosed in a steel frame fitted flush to the surface, and painted the same color as the wall. They were practically unnoticeable.

In Germany I found pretty generally in use the so-called continuous-bath (Dauerbad). This is used for the treatment of the disturbed class of insane. I had for some time contemplated installing this system at the Government Hospital, but desired to see it in use abroad first if possible. This I have now seen, and two continuous-bath rooms have since been equipped and put in operation at the Government Hospital. It is to be hoped that it will go a considerable way toward solving the problem of the proper care of the most disturbed class of cases.

The institutions in the Austrian Empire that I visited are all very old. The Psychiatric Clinic at Prague, which is a portion of the General Asylum, the physician in charge told me, was 75 years old, and some of the other buildings connected with the institution were older yet. This clinic was in a greatly overcrowded condition, and it was apparently almost impossible to give proper care to the patients, and yet from this clinic, under the direction of Dr. Arnold Pick, there issues some of the best psychiatric work on the Continent. I saw here, as also in Vienna, the so-called "gitter" bed, which I was told was entirely an Austrian product. This bed is made by extending the iron posts at each corner about 4 feet above the bed and then surrounding them on all sides and above by a heavy rope net. Patients who are disturbed, or are disposed to get out of bed and run around the ward or make trouble in any way, are placed within this inclosure, one side of which is used as a door, being locked in place so that they cannot get out. The doctor told me that he did not at all approve of this

arrangement, but that it was made necessary by the overcrowded condition of the hospital and by lack of a sufficient number of nurses.

I spent a most delightful afternoon at Gheel, about half an hour from Antwerp, where the colony system has been in vogue for so many years. This institution extends its jurisdiction over many square miles of surrounding country. This country is inhabited by a simple peasant class, whose sole occupation is tilling the fields. The hospital receives only the quieter class of patients, whom it is presumed are suitable for colonizing, although it has a central hospital building where patients can be taken care of provided they become temporarily disturbed or are ill. Arrangements are made by the hospital authorities with the peasant families to take one or two patients for which they are paid a nominal compensation, receiving their main return in the work which the patient is able to do. I visited several houses where patients were cared for in this way. In every instance the houses were scrupulously clean and severely simple. The patient's room was about the same in each instance, very small, perhaps 10 or 12 feet long by 7 or 8 feet wide, containing a single bed, a wash-stand, and a chair. A plain wooden floor, with perhaps a home-made rug by the side of the bed, whitewashed walls, with a crucifix at the head of the bed. The patient assists in the general household work, in looking after the cows, and whatever his strength and intelligence may enable him to do, and each year the hospital issues a diploma to the family who has taken the best care of their patient. These diplomas are very highly prized, and one was shown to me with a great deal of pride. Throughout the territory in which patients are cared for in this way, there are located here or there central bath houses to which all the patients in the near territory go for a bath. The doctors, unless in case of illness, are required to see each patient once a month. In each house a little book is kept where the doctor registers the time of his visit, and also takes the weight of the patient; this latter is done as an index to determine whether the patient is being properly fed or not. The superintendent thinks that 75 per cent of the insane could be cared for in this way. This is perhaps true in such a population as Gheel. This little village is many hundreds of years old, and even now consists only of one little, narrow, crooked street, with peasant houses scattered here and there, occupied by people whose parents and grandfathers for generations before have lived there and done the same work. The population is fixed, crystalized, but the experiment which has been so successful there could hardly be applied in this country with its much more restless and ever-shifting people.

The hospitals in England are very much more like our home institutions than any others I saw. The one at Claybury is beautifully situated and throughout has an air of comfort with homelike surround-

ings that was very agreeable. In English institutions, too, they are much more liberal with the employees and pay them more nearly the rate of wages paid in this country. At Bethlehem, for instance, the female attendants get 60 pounds sterling per annum (\$300.00). Employees in these institutions, too, seem to be on the whole a very good class. The Continental hospitals, however, seem to have drawn from a less intelligent body for their nurses. On the Continent, the wages paid are much smaller and the privileges granted are less. This is of course partly due to the greater buying value of money on the Continent.

At Wuhlgarten I found that the employees work twelve to fifteen hours a day, have eight days annual leave, and after they have worked for some considerable time, perhaps two or three years, a male attendant receives as a maximum wage 80 marks (\$20.00) per month.

At the institution at Claybury, in England, I saw for the first time a thoroughly constructed so-called padded room. This is made by letting into the floor and the walls for about 7 feet up panels constructed of very heavy rubber, that offers about the same resistance to pressure of a moderately inflated rubber tire does. The joints are made so perfect that the room can be kept absolutely clean, in fact the hose can be turned into it, and if for any reason it is desirable these various panels can one or all be removed. The authorities at the hospital spoke in the highest terms of the advantages of these rooms. A disturbed patient who is liable to thrash about, perhaps fall out of bed or roll about on the floor and hurt himself against walls, is simply placed in this room, with a mattress, pillows, and bed-clothing being provided. He can then thrash about at will and there is little danger of his hurting himself. Windows are placed high in the room, perhaps 10 feet above the floor, so that they are out of reach of the patient. This method of construction has been in vogue for a long time in England, but it has never been adopted to any extent in this country.

As regards the method of commitment, I found nowhere any such method employed as is now in use in the District of Columbia, and against which I have been contending ever since I have been in Washington. In every country I visited the insane are practically sent to the asylum with about as little formality as they are sent to the general hospitals, and in no place that I visited was there anything remotely resembling a jury trial, except in England a jury trial is had, but only when it becomes necessary to appoint a guardian or committee. There are several methods but it amounts in general to the court signing the commitment upon satisfactory evidence and upon the examination of physicians. In Germany very often there is no medical examination made. Patients are sent directly to the hospital and the hospital authori-

ties are trusted to keep them or not, as may be necessary. In rare instances a case may be brought before the court for decision, in which instance the court, consisting of its several justices, but having no jury, instead of summoning the patient before it goes to the hospital and sits there and takes evidence. This practically is an almost unheard-of procedure though, it is so rare.

Usually if a patient has a complaint to make, it is referred to the director (superintendent), and if his decision is not satisfactory it may be referred to the medical officer who is appointed by the Government to inspect institutions, and his decision is final. I can repeat what I have many times said in the past, and from a wider experience, that the District of Columbia stands almost alone in the civilized world in its atrocious method of committing the insane.

During the past summer my main objective point was Amsterdam, where I had the extreme pleasure of attending the International Congress on Psychiatry, Neurology, Psychology, and the Nursing of Lunatics. On my way to the Congress and afterwards during the short trip through southern Europe I took occasion to visit a number of institutions. I visited in all eight hospitals as follows:

In Belgium, St. John's Hospital at Bruges.

In Holland, Endegeest and Rhijsgeest near Amsterdam.

In Italy, the new hospital for the insane at Padua, the Psychiatric Clinic and the Asylum at Florence, and the asylums at Rome and Naples.

St. John's Hospital at Bruges has no special features of interest from the hospital standpoint. It is one of those simple, homely, European institutions in which the Sisters minister to the sick. It presents nevertheless a great attraction to the tourist in the large collection of truly remarkable paintings by that wonderful early master in oils, Memling.

The Endegeest and Rhijsgeest Hospitals are delightfully located in the country district a few minutes ride from Amsterdam. The former is for the insane. Its construction and equipment are very simple but the physician who showed us through had a broad grasp of psychiatric subjects, had studied in Germany and we found him strong in praise of the continuous bath with which the hospital was fully equipped. On the grounds of the asylum is the house in which Descartes used to live and write—and a hundred feet or so in front of it a small monument erected to his memory.

The Rhijsgeest hospital only a few moments drive from Endegeest is for neurological cases and is built more on the plan of a private sanitarium. It is here that Dr. Jelgersma, who is medical director of both institutions, and was the President of the Congress, has his laboratory. The laboratory is finely equipped and has a full force of assistants. Most excellent work is being done here, Dr. Jelgersma being a

man of no ordinary abilities in research work along the lines of neuro-pathology.

At Padua we saw what is probably the newest of the Italian hospitals for the insane. In fact it was not yet finished and is only partly occupied. There were no features of special interest about the institution. It is a well built, attractive looking hospital, constructed along modern lines on the pavilion system. It is situated on a large tract of land just out of Padua, being reached by a short and very pleasant drive. I inquired into the cost of the institution and although my memory does not serve me as to the exact figures, I am sure it was over \$1,000.00 per bed and I feel quite sure it was nearly \$2,000.00. Notwithstanding the fact that this figure includes the price of the land it seemed to me a tremendous price to pay in a country where one is surrounded on all sides by evidences of the most abject poverty. In this part of Italy the people are much more prosperous, however, than they are further south.

At Florence I found one of the most modern equipments in Europe. Here the psychiatric clinic is located on the grounds of the asylum. All suspected insane persons are sent to the clinic first and from there without additional formality are transferred to the asylum if their condition warrants it. Many are kept, however, for a considerable time and are discharged recovered without having to be sent to the asylum. The process necessary to send patients to the clinic, however, amounts to a commitment, so that the authorities have full power either to retain them there or transfer them to the asylum.

The clinic although built in 1884 contains practically all of the features embodied in more modern constructions. There is a central administrative department flanked on either side by the wings for male and female patients. These two wings open centrally into a large lecture room much as they do in the clinic at Munich. Professor Tanzi, who occupies the chair of psychiatry in the University, is the director of the clinic and delivers his lectures here. He is perhaps the most prominent of the Italian psychiatrists and it is noteworthy that he perhaps is also the most Kraepelinian.

In addition to the lectures here the clinic is provided with a large library, and well equipped laboratories for neuro-pathology and psychology. There are four assistants constantly at work here and they appear to be doing a great deal of most excellent work. The first assistant, Dr. Rossi, is a man of wide scientific attainments who has already published much valuable work.

The manicomio (insane asylum) at Rome was the next one to be visited. Our visit here was in many respects a most remarkable experience. The main entrance to the hospital is in a dirty, narrow little street, the front doorway opening through a high, forbidding looking

wall that seems to reach an interminable distance in every direction. On passing this doorway one enters a small reception hall from which a flight of marble steps leads up to a large corridor. After reaching this corridor one follows it for several hundred feet as it winds up a steep hill and finally opens on the remains of old gardens that were at one time private property. In fact the house that used to be occupied by the owner of this magnificent site is now used as a ward for some of the better class of patients. Following the winding paths of the gardens still further to the top of the hill I realized for the first time that I had mounted to an eminence overlooking the city for there at our feet was the magnificent panorama of Rome. Directly in front of us was the Vatican, the windows of the Pope's chambers, touchingly referred to by the doctor as the "poor captive," directly facing us.

As to the hospital itself there is little to be said in its praise except that it has a well equipped laboratory which showed evidences of being put to good use. The first assistant, Dr. Bonfigli, who very courteously conducted us through the hospital, appeared himself to be greatly interested in this side of the work and showed us a number of most interesting and instructive sections from work that he was engaged in.

The care of the patients appeared to be most deplorable in every way. This was especially noticeable in the disturbed wards for men. I have been living in hospitals for the insane for some fifteen years but never before have I seen such a sight as greeted my eyes as I entered these wards. Every patient, without a single exception, was tied hand and foot to the bed and every patient was a good example of the "howling lunatic" one reads about but which I had come to think did not in reality exist except in rare instances. It must be said, however, in justice to the hospital that all appearances indicated that they were obliged to do with very small appropriations. The number of attendants was extremely limited and all the appointments were of the simplest kind. Cheap care of the insane is always poor care.

The last institution visited was the manicomio at Naples. This institution is situated in the heart of the city and at its most elevated portion, it being necessary to climb a long steep hill to reach it. It is a very old building, having previously been a convent. The physician on duty received us in the laboratory where he was at work and we had a very pleasant conversation with him touching various scientific matters pertaining to psychiatry, and intimated that we would like to look over the hospital. He showed us very plainly that he did not care to grant this wish but finally on our insistence he went out of the room and evidently instructed several people to get things in shape for us to look at. After waiting some twenty minutes we were gingerly shown into two wards where all the patients had been previously lined up for our inspection.

The hospital is not only old but very primitive in its appointments and gave the same indication of small appropriations as did the one at Rome. The medical staff consists of some fourteen physicians who visit the hospital and make rounds on their several services each morning. One of the fourteen, however, is detailed for service throughout the twenty-four hours, so that one physician has such a detail once in two weeks. He is the only physician in the hospital after the morning rounds are made, and as there are some 1200 or 1400 patients it can readily be seen that the hospital very largely takes care of itself, especially when the one physician who is on duty spends all of his time in the laboratory. This is the expression of the extreme position to which the methods as they prevail in Europe in many places logically tend.

To my mind the chief distinction between the hospitals on the Continent and those of this country are that the European hospitals exert their efforts primarily along the lines of scientific advancement, while the American institutions exert their efforts primarily in the care of the patient. In the former instance if one or the other must suffer it is the care of the patient, in the latter instance, scientific research work. A great deal might be said upon the best method of dealing with the problem of uniting both of these interests. This, however, is an administrative problem and this is not the place in which to discuss it. It is quite clear that the physicians at both Rome and Naples understood that this feature, namely, the care of the patient, had not been properly provided for, for they both by their general attitude and manner endeavored to excuse the very evident conditions. I think therefore that the main fault lies in the extreme poverty of the country which makes adequate appropriations impossible. This was very well illustrated by a number of placards that were posted in the vestibule at the entrance to the Naples institution; they called for competitive examinations to fill the position of chief of staff in some two or three Italian institutions. The highest salary offered by any one of them was 3000 lira per annum and maintenance, the equivalent of approximately \$600.00. It is surely well for the peace of mind of the physician who has to live on such a pittance that he has scientific interests with which to console himself.

It seemed quite surprising that in a single country conditions could be so widely different as at Naples and Rome on the one hand as compared with Florence on the other. It all goes to show I think that Italy is not even yet a completely united country and that the different portions still lead to a certain extent an autonomous existence. I heard on every hand, however, the highest praise for the King, whom it seems is exerting his every influence to help the country out of its poverty-stricken condition by the development of its commerce and natural resources.

It may be interesting, too, to know that something over a year ago a National Committee on the Causes of Insanity was organized under the patronage of the King of Italy. I had the honor of sitting with the Committee during its meetings in Amsterdam as proxy for the United States representatives who was unavoidably absent. The Committee is composed of representatives of practically all of the civilized countries. Their meetings have resulted thus far in organizing, and appointing a permanent secretary who is located at Zurich, and a permanent meeting place at Lugano. Their main efforts now are being concentrated on getting sufficient funds so that permanent quarters may be secured, clerks hired, and the necessary expenses for the everyday routine of business that will undoubtedly ensue, be met. After this is done they will take up the question of securing through the State Department access to the archives of the various Governments they represent for the purpose of obtaining such material as will aid them in throwing light on the problem under consideration.

Aside from what I saw of hospital construction and management, no small part of the benefits to be derived from such visits as I have recorded above results from the stimulus received by coming into personal contact with the men who are actually engaged in solving the problems of medicine and seeing the places where they do their work. I had the pleasure of meeting a great many physicians who are renowned as specialists in the various departments of nervous and mental diseases, aside from seeing a number of places that are of historic interest in the development of neurology and psychiatry, particularly Charcot's Clinic at La Salpêtrière.

MODERN MEDICINE IN CHINA.*

By W. H. DOBSON, M.D., (G. W. U., 1895),

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When one leaves the progressive little kingdom of Japan and crosses the Yellow Sea to that land of mists and myths, Far Cathay, it is to leave the nineteenth and twentieth centuries to step ashore in the dark ages. In no one department of knowledge is this more true than in medicine. The Chinese have no science or generally practiced principles of that art. We have here a country of at least two thousand years of growth, with history and mechanical arts progressing from that period, but during the same time there has not been one step in the divine art of healing. However, it is not my intention to give you history, which may be found in any good library; I am sure it is your desire to hear of my personal experience as a physician during the eleven years since the cutting of the cord by our revered Alma Mater.

In the beginning it is but just to state that nearly all the modern medicine practiced to-day in China is by medical missionaries sent out as representatives of various religious bodies in America and Europe. There are a few hundreds of native graduates of schools opened by these medical missionaries. None of these native physicians undertake surgery beyond minor operations unless they are serving in missionary hospitals. Thus you see the labor of upholding the principles for which we stand devolves upon one or two hundred white men and women.

One word of ancient medicine and the native herb doctor. You have all heard of his formidable prescriptions of tiger's bones, bear's gall, deer's horn, lizards, etc. The more filthy they are, the better medicine. All are given because they are "good for" the disease. In my dealings with patients they disclose the quack's classification of diseases and remedies by inquiring whether the ailment is cold or fever. The native doctor needs no study, no examination or other qualification. He has often failed in other business and has taken up drugs as a last resort. Many of the governmental literary graduates dabble in medicine for pecuniary profit. Should the doctor have had ancestors who followed the same calling he will gain the greater confidence of his countrymen. Alas, this confidence is not due to any belief in heredity but because the son will probably be in possession of many prescription books of his progenitors. His fees vary from one hundred cash, or five cents, to a chicken or a horse. I have seen herb doctor and parent haggle over a fee while precious moments of life were ebbing from the child.

* Paper read before the University Medical Society, January, 19, 1907.

Putting on a solemn and "never made a mistake" air he feels three pulses in each wrist. He thus examines the six regions of the body, and no questions or other examinations are necessary. Many apothecaries employ a doctor to sit in the shop and see patients who buy their nauseous compounds before going out.

I have gone to such a length to describe these doctors and their ways in order that you may in part imagine the difficulties which we encounter in examining ignorant and superstitious people accustomed to the native quack. Take for instance a woman's hand and wrist presented from behind a curtain for diagnosis of, and relief from, impacted shoulder at the vaginal outlet.

In our practice of medicine and surgery we must always remain pupils of those who have time for original research. The medical man connected with the mission work is overwhelmed with the mass of suffering humanity. Serious cases come thick and fast allowing no time for detailed study of the individual or his disease. To alleviate gross suffering so as to permit of but a fair degree of health is in many cases the limit to which treatment is carried. Cases cannot be followed up except where they return to the hospital. The territory of one physician extends to a circle of often two hundred miles diameter, within which there are no brother physicians to share burdens and join in consultation. There are no means of comparison nor educational centers to visit.

Many of the larger hospitals have schools for instruction in Western medicine. The government is now opening some medical colleges with Japanese instructors. There is no opportunity for practical anatomy or post mortem investigation because of superstitious reverence for the dead. Dissections of animals and dissections in the operating room at present supply anatomical knowledge.

Some hospitals are locally supported but the majority look to American and European benevolence. The missionary physician charges a nominal fee where the patient is not too poor.

Sanitary problems are complicated by omnipresent insects and filth. Green vegetables fertilized with human excrement carry intestinal parasites and bubonic plague. China is innocent of sewerage or water supply systems. Hogs and dogs act as public scavengers, while old women follow the hogs and dogs to pick up their droppings. Filthy surface water finds its way into the public wells. Heavy spring rains providentially remove accumulations of months of filthy deposits. In our southern country mosquito nets are a necessity.

The food supply is one of our greatest questions. The common laboring classes do well to receive one meal of rice a day. When such people come for directions to take their medicine they remind one of the Irishman who when told to take his medicine after meals replied,

"I can't do that sor, I haven't got the meals." To prepare a patient with bad chronic cystitis for operation for stone, or a phthisical individual for his fight for life we order eggs and meats but find that they are only able to obtain sweet potatoes and salt fish drippings.

The Canton Hospital, the largest in China, receives annually 27,000 dispensary visits and there are over two thousand operations performed in that time. Since leaving that hospital I have one under my exclusive charge where we have forty beds and receive 6,000 dispensary visits, and perform over three hundred operations yearly. I believe our hospital practice will compare with that in America. Asepsis and the careful preparatory and after treatment keep down the mortality. The majority of surgical cases are chronic weakened individuals, and the mortality is less than one per cent. From the immediate relief it affords surgery is the most telling factor in our practice. Many operations are miracles in the eyes of those people. They are prone to applaud the opening of a simple abscess and to pass without notice a nice dissection in the carotid triangle in extirpating diseased lymphatics.

Lack of medical skill and ignorant tampering cause disease to appear in more extended and chronic forms than here in America. The felon of the distal phalanx becomes a general abscess of the hand; a comminuted fracture is seen after the bones have reunited in deformity; ulcers often cover one-half of the leg; spleens enlarge until the entire abdomen presents a hard surface; ring-worms runs off into the surrounding space with the exception of the points where the ring crosses hand or foot; fifty to seventy pound abdominal tumors are of common occurrence, and fatty tumors weigh down their victims with years of burden. Acute exanthemata, common in America, are seldom seen with the exception of measles and confluent smallpox. In their places we have cholera, plague, beriberi, leprosy, tetanus neonatorum. We cannot specialize. A list of operations for one day may show cataract, perineal lithotomy, internal hemorrhoids, an enormous ovarian cyst, and a club foot.

A large share of our attention is engaged with eye diseases. Trachoma with its resulting disorders holds the first place. In our operations for entropium I have developed what is to me a new procedure. It consists of a long loop suture catching the upper edge of the tarsal cartilage, thus anchoring the palpebral margin high up. I also use the excised strip of skin to fill in the gap covering the tarsal cartilage. Simple cataract extraction is the operation of choice in all uncomplicated cases.

Next in frequency to operations on the eye come those for urinary calculi. We rarely see stones in the pelvis of the kidney. The average weight of calculi is about one ounce, though two or three ounce stones are of common occurrence. Median perineal section with the incision

extended laterally around the anus is our operation of choice. I have removed several three ounce stones through the perineum. Most of the specimens are composed of sodium urates. Occasionally one of calcium urates is seen. About ten per cent of lithotomies are performed on children of from three to six years of age, while one per cent are upon females. In the case of a boy of eight years I removed a long stone of one ounce in weight which was firmly attached to the bladder wall posteriorly. The free end was pointed and plugged the urethral opening upon contraction of the bladder. Straining had caused an extrusion of the prostate and rectum outside of the anus.

Tuberculosis is general. Results of treatment similar to those in this country can be had where there is proper food and outdoor life. We have many cases of tubercular caries. I had one case where the entire head of the femur was found loose underneath the skin over the hip joint. For one case of caries of the seventh cervical I had to make a complete adjustable iron brace to support shoulders and head from the hips. Iron rods, etc., were purchased in native shops.

The alveolar process of the lower jaw is often destroyed as a result of long continued tooth abscesses. In one case I found a sequestrum of the whole alveolar process together with the anterior portion of the ramus and coronoid process entirely separate lying under the mucous membrane on the outer side of the right jaw. The teeth were all imbedded in a new jaw which seemed sound and serviceable. We are called upon to replace a great many dislocations of the lower mandible from excessive gaping.

Speaking of teeth reminds me that the native tooth extractor uses his fingers which have been educated from childhood to act as forceps. A trial demonstration of my skill as a dentist was sought by an old woman on one occasion. She was so surprised and pleased when a tooth was painlessly removed that she immediately requested me to pull ten more.

In concluding this paper I shall briefly refer to some cases which may be out of the common run.

Field laborers present chronic painful enlargement of the posterior portion of the os calcis. The disease, while slow, has acute exacerbations of pain so severe as to prevent walking. At first I attributed these swellings to chronic inflammation and calcification of the bursa beneath the tendo achillis. Other cases showed a distinct enlargement of the whole posterior portion of the bone. There are no pathological data from microscopical examination. Maxwell of Formosa in "Tropical Medicine" has written of his experiences with this malady. All systemic remedies, together with counter irritations, and hot air baths fail. He has suggested the only treatment which is to raise a button of bone forcing a quarter inch trephine through into the spongy portion. This in most cases relieves the pain immediately.

A boy of six years was presented with the history of having fallen out of bed two days before. The only abnormal conditions present were constipation and a tumor about twelve inches in length extending from the left iliac through the hypogastric region up to the vicinity of the gall bladder. The tumor had a fecal consistency and was painless. The diagnosis was intussusception of the small intestine up the ascending colon to the right hepatic region. The fact that there was no inflammation permitted an attempt at reduction by taxis. This was accomplished and the ileo-caecal valve returned to its normal position. Now careful palpation disclosed the presence of a ball of ascaris lumbricoides obstructing the valve, and portions of the worms were made out extending along the ileum. After about one-half hour of manipulation to disentangle the worms, a gurgle and an almost immediate request to defecate resulted in the appearance of several ascaris, and a large quantity of fecal matter. No other treatment was necessary. The interesting point of this case was the possibility of distinguishing the presence of the worms by external palpation. I should be interested to hear from any one having a similar case.

Within a few miles of our hospital there is a locality from whence come many cases of Hodgkins disease. We have excised and treated them in many ways but the only useful treatment is the early removal of adenoids from the nasopharynx, and relieving all chronic conditions in the nose. This seems to stop the symptoms in many cases where I am certain the disease would have developed if not so treated.

I have never seen but one case of appendicitis in a Chinese.

The native household treatment of certain disorders is often pathetic. Hung around a child's neck we find a portion of a goat's horn to cure infantile or goat's paralysis. The tender skin of an infant shows many scars of the actual cautery applied to relieve colic. I saw one case where the child had been in convulsions followed by coma. The treatment was to force it to cry. To do this the grandmother bit the bone on either side of the tendo achillis on each foot.

At a case of post-partum hemorrhage the following sight met my eyes: A woman squatted over a tub. Her head was covered with red grease and ashes from several lighted candles and sticks of incense stuck in her knotted hair. Behind her and grasping her hair was the brother of her husband with a large knife in his hand. He was making passes with the knife and savagely yelling "Get out, get out." In the back ground stood an old neighbor with a drawn sword and a musket. They were trying to frighten away the evil spirit causing the flow of blood. After a deal of persuasion they permitted the woman to get on the bed when a dose of ergot together with a little manipulation contracted the uterus and all was serene.

STERILITY IN THE MALE, ITS CAUSES AND SURGICAL TREATMENT.*

By FRANCIS R. HAGNER, M.D.,

Professor of Genitourinary Surgery.

It is only in the past twenty-five years that the subject of sterility in men has been carefully studied and valuable conclusions deduced. In earlier years unfruitful marriages were always ascribed to the wife, who in many instances was subjected to needless gynecological operations and treatment. If a man seemed well developed sexually, and was able to copulate in a normal manner, and had what seemed normal ejaculations of semen, he was considered potent, and failure to have offspring was always attributed to some abnormal condition in the woman.

With the advance in genitourinary surgery the condition of the semen and seminal tracts has been carefully studied, with the result of proving that in a considerable number of cases, where copulation was effected and the appearance of the semen was normal on microscopical examination, the fluid was found lacking in spermatozoa or else these cells were nonmotile or degenerated. As a net result of many investigations it may be stated, in general, that in cases of unfruitful marriages the husband is the sterile member of the family in about one case in six.

According to Kehrer, the cause of childless marriages is now sought much oftener on the side of man than has heretofore been the custom. Kehrer, himself, gives the results in a series of 96 cases. In 3.12 per cent there existed inability to copulate. In these cases there had been a preceding history of excessive masturbation. The men suffered from frequent pollutions, or their ejaculations were premature, and the penis could not be inserted into the vagina. Kehrer claims that impregnation may occur if a speculum be inserted into the vagina before copulation, and in several cases results were obtained by this maneuver. In 21.31 per cent azoospermia, absence of spermatozoa, existed. In practically all of these cases there was a history of gonorrhea with unilateral or more often bilateral epididymitis. Azoospermia was also found where no disease of the sexual organs had occurred, and where nothing abnormal in the genital organs could be demonstrated. Oligospermia, paucity of spermatozoa, was demonstrated in 11.45 per cent. Here there was a history of gonorrhea with epididymitis, or syphilis. It will be seen from this series of 96 cases that 63 per cent of the sterile cases had a history of gonorrhea with infection of the epididymis and prostate.

* In collaboration with Homer G. Fuller, M.D. Read before the George Washington University Medical Society, April 20, 1907. Reprinted from *New York Medical Journal*.

Noeggerath found 8 sterile marriages in a series of 14 to be the fault of the male. Gross in 192 cases found the male deficient in 18 per cent.

Sterility in the male is due (1) to aspermia, non-secretion of semen; (2) to azoospermia, where the semen does not contain spermatozoa; (3) to oligospermia, where the spermatozoa are few in number; (4) to conditions where the spermatozoa may be motionless or the motility to be transient, or (5) to obstruction to the passage of semen to the urethra or seminal vesicles, and the escape of semen outside of the normal channels, as in cases of hypospadias and fistula. Men with double undescended testicles are almost invariably sterile; so, too, is this the case in those whose testicles have received serious injuries causing destruction of the secreting structure or traumatic occlusion of the efferent ducts. This latter is a condition which obtains in cases of epididymitis; the exudated lymph fails to be absorbed, and becomes transformed into contracting connective tissue, which results in an obliteration of the tubes of the epididymis. Furthermore, the mouths of the ejaculatory ducts may be occluded as a result of operation for stricture, stone, or prostatic conditions. In the cases of azoospermia, absence of spermatozoa, the ejaculated fluid will present all the physical properties of normal semen, as regards smell, consistency, and so forth. Where we have small calibered strictures, the fluid is either forced back into the bladder or retained in the urethra behind the point of constriction, until erection subsides, whence the fluid slowly dribbles out. A few cases have been recorded where none of the reasons cited would hold, but these have been explained by the belief that the semen was perverted in quality or deficient in quantity, through constitutional depression or cachexia. Here the microscope would repeatedly disclose a state of azoospermia or oligospermia with the few spermatozoa showing but feeble motion or else complete absence of motion. And after no course of treatment other than that for the cachexia we would eventually find the presence of the procreative bodies and soon hear of an impregnation. Then, too, we are forced to consider the theory of an apparent lack of affinity of the one cell for the other; we see this demonstrated in cases of a childless first marriage being followed on both sides by marriages resulting in a large family for each member of the former union. We hear of the so-called physiological and psychological question with which the stock breeders have to contend at times, and which forces them to set aside a prized stallion of known abilities for one of inferior pedigree.

Next to gonorrheal infections, frequent masturbation and sexual excesses are the most frequent cause of sterility in the male. The prolonged and frequent overstimulation of the secreting structure of the testicles finally results in exhaustion of the organ, the spermatozoa being

imperfectly formed, even though the quantity and quality of the fluid may be apparently normal. The virility of the spermatozoa is often in direct proportion to the general physical condition of the patient. The oft-repeated shocks to the nervous system, which occur especially in masturbators, who take advantage of the time and place which are always convenient for their purpose, lowers the general physical condition, producing constitutional depression and cachexia, and thus affecting the virility of the spermatozoa. I have seen several of these cases perfectly cured by leading a hygienic sexual life.

In bilateral syphilitic and tuberculous disease, a considerable proportion are sterile on account of the destruction of the epididymis in tuberculosis, and the destruction of the testicle itself in syphilis. Another cause existing in this modern age is the X ray. Workers in X-ray laboratories and physicians doing this work are the ones affected. One prolonged exposure has been known to cause sterility lasting three months. At first the spermatozoa are dead, and later disappear altogether. I know of seven workers in an X-ray laboratory in New York who have been sterile for over a year. I do not believe that any permanent cases have been reported from this cause. It is too early yet to say. One worker of my acquaintance was sterile for some months, but after keeping out of the rays for three months this defect disappeared and his wife became pregnant. When inflammation has attacked the greater portion of the prostate, so as to block up the ejaculatory ducts, after an orgasm there may be two or three viscid drops escape that contain principally pus cells and degenerated prostatic cells, but no spermatozoa. In other cases there may be so much pus present in the prostatic and vesicular secretions as to cause the death of the spermatozoa when they come into contact with this element of the fluid. The diagnosis of this condition should be made on microscopical examination by finding pus and dead spermatozoa in the fluid obtained by massage of the prostate and seminal vesicles.

I have seen several cases where the spermatozoa were nonmotile that were cured by treatment of the prostatic condition, and in one case so much pus was present that part of the prostate was excised (care being taken not to injure the ejaculatory ducts); the pus disappeared and the spermatozoa regained their motility. The term false aspermia or malemission is sometimes employed to designate that condition in which normal semen is discharged into the urethra, but does not reach the meatus, flowing back into the bladder to be discharged drop by drop from the urethra after completion of coitus. This is commonly due to stricture, the caliber of which may be great enough not to interfere with micturition, when the circulation of the penis is unim-

paired, but when the intense congestion incident to erection takes place, the caliber of the urethra is so reduced that no semen escapes.

The following case shows this very admirably: J. H. W. came to my office in September, stating that he had gonorrhea eight years before and an internal urethrotomy three years later; following the operation patient nearly bled to death, as he is a hemophiliac. He had had double epididymitis six years previous, and when I first saw this case I thought it a case of sterility due to epididymitis. The patient collected semen in a condom; the amount obtained was very small and proved on microscopical examination to be nothing but mucus. He had not complained of difficulty in urination, but on examination a No. 12 French bougie was the largest instrument that could be passed. After gradual dilatation the fluid ejaculated during intercourse appeared normal in amount.

As I have heretofore mentioned, the principal cause of sterility in men is bilateral gonorrheal epididymitis. Benzler in the *Archives of Dermatology and Syphilis* in 1898, in looking up the history of old soldiers who had gonorrhea while in the German army, found that among those who had been married three or more years 10.5 per cent who had suffered from gonorrhea without epididymitis were childless; these were probably the cases with chronic prostatitis and seminal vesiculitis; 23.4 per cent of those having unilateral epididymitis, and 41.7 per cent of those having bilateral epididymitis, were childless. It will be seen from all statistics that epididymitis is by far the most common cause of sterility, and it is most common in the cases where both sides were involved, almost 50 per cent being sterile. Statistics show that traumatic epididymitis, unless very severe, rarely leads to sterility. Orchitis probably never occurs in gonorrheal infections. I say this from results in twelve cases that I have operated upon, with acute epididymitis of the severe type, in none of which was the testicle itself involved.

In epididymitis it is well known that the globus minor is the portion of the epididymis most involved, and it is in this very portion that occlusion has the most dangerous results, as there is here but one efferent duct, while in the globus major the efferent ducts are numerous, and the obstruction of one or two would still leave open other channels. It was because of the known patency of the globus major following gonorrheal epididymitis, when the globus minor and vas deferens in this region became occluded, that the operation of anastomosis of the vas deferens and the globus major was considered. The prognosis for the return of spermatozoa in these cases, unless operated upon, is positively hopeless.

Dr. Quinby of Boston has done some experimental work on guinea-pigs. He tied off the vas deferens at its exit from the globus minor,

and then made an anastomosis between the globus major and the vas above the ligation, in the method recommended by Dr. Martin of Philadelphia (which is described later). Instead of using fine silver wire, very fine silk was employed.

In from 10 to 27 days three out of four of the pigs thus operated upon showed spermatozoa in the fluid ejaculated by means of electrical stimulation.

Two cases of sterility (following double gonorrheal epididymitis) under my care came to operation, one at the hands of Dr. Martin of Philadelphia, the other my own. In both instances Dr. Martin's method of procedure was employed, which I will describe. An incision is made through the skin and coverings of the epididymis, which is approached from the outer side so as not to wound the spermatic artery. The artery of the vas is pushed aside and a one-half-inch incision is made in the vas deferens on the level with the globus major, along its axis, care being taken to get into the lumen of the tube. A portion of the globus major is picked up between two fine forceps and an elliptical piece removed to correspond with the incision in the vas deferens. An examination of the fluid obtained by squeezing the globus major will show spermatozoa. Four fine silver wire sutures on curved intestinal needles are inserted, one at the upper angle of the wound joining the vas and the cut surface of the epididymis, one at the lower angle, one at the outer, and one at the inner side. When these are drawn out a perfect little pocket is formed by the spreading out of the cut vas deferens, and the elliptically cut globus major. The wound is then closed and dressed. It will be seen that the operation is not one of grave danger to life. It is one in which the existing condition cannot be made worse, but where, in fact, everything is to be gained and nothing to be lost. The first case was one referred to me by Dr. Wellington. The patient was a robust appearing man of thirty-eight, who had been married several years. His wife had been examined and no cause for sterility ascertained. He had had gonorrhea with double epididymitis some years before. Frequent examinations of the spermatic fluid showed no spermatozoa, but the fluid obtained was loaded with pus. The prostate and seminal vesicles had been the seat of chronic inflammation. The patient was operated upon by Dr. Martin, and the examinations after operation revealed live spermatozoa. This patient's wife has not given birth to a child, but has possibly succeeded in having a miscarriage.

T. D., twenty-nine years old, was first seen by me in February, 1905, being referred to me by Dr. Wall. The patient was a robust, healthy man of 235 pounds; he had had gonorrhea two years before and a double epididymitis three weeks later. There were numerous shreds

in both urines. Examination revealed a large soft prostate and markedly enlarged soft vesicles; the fluid expressed by massage showed numerous pus cells. Patient was treated for six months, by which time the shreds had disappeared and the prostatic and vesicular fluid was free of pus. He was then married, and returned in about six months, complaining because his wife had not become pregnant. Dr. Thomas Kelley had been attending the wife, and said she was normal. It in every way. Examination of his semen showed no spermatozoa. It was thought possible that the absence of spermatozoa was due to frequent coitus. He abstained from coitus for two weeks and the semen still failed to show spermatozoa. He was kept under observation for two months, and repeated examinations proved the absence of cells that could possibly have been spermatozoa. He was advised, and consented to undergo an operation for anastomosis of the vas deferens and epididymis as his only chance for improvement. This was done one year ago at Garfield Hospital; recovery was uninterrupted, and he left the hospital in one week. Examination in one week showed no spermatozoa, but another examination a month after operation disclosed their presence in numbers. An examination of the semen on April 10, 1907, over a year after operation, showed the fluid filled with actively motile spermatozoa. So far no pregnancy has resulted in this case, but I continue to hope. Very few of these operations have been reported.

Dr. Martin has recently reported seven cases, four cases where spermatozoa appeared after operation, two cases not heard from, and one failure. One patient included in the four successful cases is the father of a healthy child. In some of Dr. Martin's cases the spermatozoa did not appear at once after operation, and in my case the spermatozoa did not appear until nearly a month. I believe this is accounted for by the slight inflammatory reaction following the operation causing occlusion of the vas deferens which disappears as the inflammatory exudate is taken up, thus allowing the vas and the ducts of the globus major to become patulous.

We know that after this operation in the majority of cases spermatozoa return to the fluid, and there seems no reason why fecundation should not take place. I might do well to quote Dr. Quinby's ending to his paper. The three main facts for employing this operation are: (1) The condition cannot possibly be made worse by operation; (2) there is double chance for success, as patency on one side is sufficient; (3) the operation has been found feasible.

THE PHILOSOPHICAL FOUNDATIONS OF
CHARLATANRY IN MEDICINE.*

By D. K. SHUTE, A.B., M.D.,

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It is not the object of this paper to endeavor to point out how the human race has gradually passed from those phases of intellectual development where it contemplated with craven fear the "signs and wonders" in the skies to the appreciation of the beauty and majesty of law in the heavens; or from the "Prince of the Power of the Air" to meteorology; or from magic and all of the black arts to physics and chemistry; or from the miracles of the Middle Ages to modern medicine; from fetichism to hygiene; from demoniacal possession to insanity; from diabolism to hysteria; or from legendary history and folklore to comparative mythology. In short, the object of this paper is not to epitomize the history or the evolution of modern medicine. Neither is it the object of this paper to indicate the history of the conflict of superstition with modern medicine, for we had a very interesting paper of this kind from Dr. James Dudley Morgan last December. Rather it is the object of this paper to attempt to indicate the reasons for the existence of so many aberrations in medical beliefs and medical practices on the part of the public at large.

All educated and experienced physicians are aware of the fact of the extensive prevalence of charlatanry throughout the history of human culture and at the present time; they also are aware of the fact that the patrons and dupes of what educated physicians call charlatanry are not confined to any class of men or women. Men and women of the highest culture and refinement, as well as ignorant persons, are among the partisans and the disciples of many vagaries in medicine.

It has, therefore, seemed to the writer that it might prove interesting as well as instructive to devote some thirty-five minutes to an endeavor to seek out some of the underlying principles of successful charlatanry.

Probably quite a number of factors could be mentioned as helping to constitute the philosophical foundations of charlatanry in modern medicine. But at least five factors stand forth as elements of stupendous power in cultivating and maintaining such an extensive field of charlatanry as may be witnessed in any modern state, whether civilized, barbarian or savage. These factors are: (1) Human suggestibility. (2) reasoning by analogy in modern people; (3) reversions to primitive methods of philosophizing (mostly analogical reasoning); (4) the assumption that ideal associations have corresponding material connections (mostly analogical reasoning); (5) morbid imagination.

* Extracts from the annual address as President of the Medical Society of the District of Columbia, given Dec. 18, 1907.

These five factors are easily reducible to three, viz: *suggestion, reasoning by analogy, and morbid imagination.* . . .

The concomitance of ideation and cerebration is a fact of overwhelming importance in the study of the mental activities of mankind. It thrusts itself upon the attention of the thoughtful psychologist and biologist.

It constitutes the scientific and philosophical basis of that factor of supreme importance in the beliefs and conduct of the human race, viz: of human suggestibility.

Suggestion and persuasion are practically identical in that they both inculcate ideas, the former appealing to blind faith, and the latter to logical, clear and critical reason. Bechterew has cleverly written that logical persuasion enters the understanding by knocking at the front door, while suggestion enters by the back stairs. Dubois has estimated that only three per cent of the human race are free from the slavery of suggestion. He goes on to say that human suggestibility is incom- mensurable. It enters into every act of life, colors all our sensations with the most varied tints, leads our judgment astray and creates illusions in spite of our reasoning faculty. As soon as we leave the firm ground of mathematical reasoning we experience an incredible difficulty in resisting suggestion. When we form an opinion it is very rare that logic is the only cause. Esteem, affection, our secret desires and feelings, the charm of language, the tyranny of words, all mingle with the cold current of logic and lead us into error.

Ideas are so powerful that not only can they modify or distort a preexisting idea or sensation, but they can create sensations in their entirety. There are thousands of persons who, the moment they have read about or heard described a group of symptoms, immediately feel those symptoms. Certain persons experience a sensation of touching oil and the smell of petroleum in taking up a lamp which has never held any oil. The wine which is poured out of a dusty bottle bearing the label of a celebrated vineyard always seems better than it really is. The majority of persons feel various sensations in touching the pole of an electric apparatus when it furnishes neither currents nor discharges.

The credulity of the multitude finds its justification in human suggestibility. The suggestions of charlatans, whether verbal or in printed circulars, or in newspaper advertisements, constitute a very extensive and immensely fertile field for disseminating broadcast errors and superstitions in all matters pertaining to medicine. It was due to suggestion or psychotherapy that so many cures were made in the Middle Ages by pilgrimages to the tombs of saints, by holy waters, and by being in the presence, or by touching the relics, of saints. It is due to the overpowering sway of suggestion that so much is accomplished

in modern times by christian science (a parody upon Christianity), by osteopathy, by patent medicines, and the like. . . .

It is sad to relate that physicians themselves are too often to blame for the undue sway of suggestion in medical affairs, and that charlatans and places of pilgrimage profit by the mistakes of physicians. Physicians too often declare that a disease is incurable. They make erroneous diagnoses or fail to accomplish any good, and too often forget the influence which the mind exercises over the functions of the viscera. They forget that when the desires of the sick and those who are suffering harmonize with the suggestions of charlatantry, then is a golden opportunity for wonder-workers of all kinds.

When, added to the above considerations, charlatans come in contact with invalids who have mental defects or a characteristic lack of logic, then does suggestion have all the firmer sway. When the mind is not critical and logical, or when, though critical and logical, it is not versed in at least the elements of medical knowledge and medical history; when it knows nothing of the history of charlatantry, and of the potency of suggestion; when, in addition to these factors, considerations of economy or parsimony are present, then, no matter how great the attainments of this mind may be in other fields of culture or human endeavor, this mind may at any time become the patron or the dupe of the grossest vagaries in medicine or charlatantry.

Now let us turn from human suggestibility to human reasoning by analogy. The clever Lord Chesterfield relates, in one of his charming letters, that the English King had been ill, and that people generally expected the illness to be fatal, because the oldest lion in the Tower, about the king's age, had just died. And then he exclaimed in his letter, by way of comment, "So wild and capricious is the human mind." But Tylor, in his fascinating work on "Primitive Culture," says that the thought was neither wild nor capricious, but was simply such an argument from *analogy* as the educated world has at length painfully learned to be worthless; but which, it is not too much to declare, would to this day carry considerable weight to the minds of four-fifths of the human race.

On this principle it is easy to understand how the art of taking omens from meeting and seeing animals, and therefore how augury originated. It is perfectly clear why the omen of the vulture should mean rapacity; why flies, returning however often they are driven off, should be the signs of impudence and importunity, while bees, types of an obedient and industrious community, should be the omen of luck to a king. It is still plain to us why there should be a foreboding of ill from the owl's doleful note, and the suggestion of victory from the fierce swooping hawk, a thought which, in medieval Europe, made the bird of prey the warrior's omen of conquest.

The modern German peasant who says that meeting a flock of sheep is lucky, but a herd of swine unlucky, and the Cornish miner who turns aside in horror on meeting a rabbit or an old woman on his way to the pit's mouth, are illustrations of survivals in culture, and are to this day keeping up relics of primitive culture as genuine as any flint implement dug out of a tumulus. The art of taking omens from dreams is explained by the same principle.

Man, having learned to associate in thought those things which experience revealed as connected in fact, has often proceeded erroneously by reasoning from analogy to invert this process, and to assume that association of ideas must involve analogous associations in reality. In the hands of the trained and skilled observer and experimenter this process is invaluable and is called the scientific use of the imagination. It enabled Leverrier and Adams, independently, to predict the existence and the discovery of the planet Neptune before it was known to exist. But in the hands of any but rigidly trained thinkers, checked and balanced by rigid rules of evidence, the process leads to the wildest vagaries. This is not only true of man in his primitive culture, but also of men of the highest culture in the Middle Ages, and of many modern men, ignorant and educated alike.

By a vast mass of evidence from savage, barbaric and civilized life, magic arts which have resulted from thus mistaking an ideal for a real connection may be clearly traced from the lower culture where they originate to the higher culture in which they are survivals. Such are the practices through which a distant person is to be affected by acting on something closely associated with him, as his property, clothes he has worn, and especially all cuttings of his nails and hair. Not only do savages, high and low, live in deadly terror of this witchcraft, but even European folklore preserves this primitive reasoning, and the modern German peasant, during the days intervening between his child's birth and baptism, is unwilling to lend anything out of his home, lest witchcraft should be worked through it on the unconsecrated baby.

When we hear of North American Indians making images of their foes, whose lives they expect to shorten by piercing these images with their arrows, we should remember that these savage people have their representatives among us moderns in the Devonshire peasant of Eng-land, who hangs in his chimney a pig's heart stuck all over with thorn-prickles, so that the heart of his enemy may likewise be pierced.

There is no better subject matter for study, therefore, the processes of the of the laws of the mind and to study, therefore, the processes of the imagination and of analogical reasoning, than the well-marked incidents of mythical history; for these incidents range through every known

period of civilization, and through all the physically varied tribes of mankind.

The rough nature-myths of savages are the expression of the lessons they have learned from their child-like contemplation of the universe. They are at once the science, the philosophy and the religion of primitive man. The anthropologist traces these rude nature interpretations up into times when they were molded into complex systems of mythology, stiff and monstrous in Mexico, distorted into bombastic exaggeration in the Asia of Buddha, but gracefully artistic in classic Greece. He can observe how the mythology of ancient Greece and Rome, once so true to nature, came to be considered as allegory and was then degraded into sham history. Finally, in our modern civilization, we find that relics of the structures which were reared with such strength and skill by the primitive observers of nature, or the myth-makers, must now be sought in vulgar superstitions, in scraps of nursery folklore, in old dying legends, in fragments of old ideas which still hold an inherited rank gained in past ages of intellectual history, and, finally, in thoughts and allusions carried on from ancient days by the perennial stream of poetry and romance.

The stupendous results that have been achieved by reasoning from analogy can be briefly though profitably illustrated by noting primitive man's mental attitude towards the striking phenomena of the heavens, chiefly in sunrise and sunset, cloud and storm, in meteors, comets and constellations, and the like.

We moderns pride ourselves upon our coldly prosaic and rational temper towards natural phenomena. We have come to believe that all events are taking place regularly in strict conformity to law. But primitive man knew nothing about physical forces, nothing about the laws of nature, nothing about the necessary regularity of things.

Where the activities of the human mind, whether primitive or modern, are not headed off and checked in various directions by established and rigid rules of experience, this same human mind can develop an unlimited capacity for believing and fancying. The fact that the ancient inhabitants of India regarded the rain clouds as cows with full udders milked by the winds of heaven, is not one whit less incomprehensible than many beliefs that have been entertained by many medieval and modern men.

The sole measure of things that primitive man possessed was himself; consequently he made the natural deduction (based upon reasoning by analogy) that everything that moved or had power of movement, did so because it was alive. A personal will and life was attributed to night and day, to waterfall and whirlpool, and in a thousand different forms this conception was expressed. The thunder was the roar of a mighty beast; the lightning a serpent darting at its prey. The modern

conception of the phenomena accompanying the revolution of the earth upon its axis in twenty four hours, was explained by early man as the swallowing up and casting forth of Day by Night. Night was commonly personified as a huge wolf.

This scientific explanation of day and night by primitive man we now designate a myth, whether it has evolved, in the course of ages, into the legend of Tom Thumb, who was swallowed by the cow and came out unhurt, or the pretty story of little Red Riding Hood. This story is mutilated in the English version, but is known more perfectly by old wives in Germany, who can tell that the lovely little maid in her shining red satin cloak was swallowed with her grandmother by the wolf, till they both came out safe and sound when the hunter cut open the sleeping beast.

The primitive man's conception of the ultimate victory of the personified Sun with his unerring rays over the demons of frost and snow in Winter, has given rise to the conception of infallible skill in archery, which underlies such a great variety of popular fairy tales. The story of William Tell is the last reflection of the beneficent divinity of Summer.

Again, throughout the whole of Indo-European mythology the souls of the dead are supposed to ride on the night-wind, with their howling dogs, gathering into their throng the souls of those just dying as they pass by their houses. Hence, when a person dies it is still customary, in many parts of Europe, to open the windows so that the soul may easily join the mystic cavalcade. The howling dog, whose appearance under the windows of a sick person is such an alarming portent to some persons, is but the modern echo of the wish-hound of Hermes, or, in other words, the tempest or howling wind personified as a great dog or wolf by early man. To this day, as the gale sweeps past their cottage doors the English peasants believe they hear the wail of the spirits of unbaptized children. In Persia and India, when a person is dying a dog is brought to the bedside in order that the departing soul may be sure of a prompt escort. In classic Greece we have the fleet greyhound of Hermes come to escort the soul to the river Styx.

So it is with so many popular stories such as that of Hercules, Odin, Cinderella, the Sleeping Beauty, etc.; they are the offspring of nature-myths, the result of primitive man's attempt to explain the phenomena of nature by reasoning from analogy.

Primitive man universally believed that the soul can temporarily quit the body during lifetime. It was the only way he could explain the phenomena of dreams.

Then away down the current of time, in the Middle Ages, the phenomena of catalepsy and trance were cited in proof of the theory that the soul can leave the body and afterwards return to it. Further, the intensely realistic mind of antiquity arrived at the notion that the souls

of men could enter into the bodies of beasts, and also into inert objects, as stones, idols, pools, and the like.

These pagan theories, however, did not acquire their most horrible features until they came in contact with and were modified by the theology of the Middle Ages. Then witchcraft blossomed forth and continued even into our period of colonial history. A theory which it has been estimated, resulted in the burning alive of nine millions of human beings.

One phase of it was the development of the dreadful theory, or, as we call it now, the superstition of werewolves; the superstition that with the aid of demons human beings could leave their material bodies reposing in sleep peacefully at home, while their souls were in the bodies of wolves preying upon cattle, children, women and men. This superstition, originated and intensified through reasoning by analogy, was apparently confirmed by many singular phenomena. It is known that in comparatively civilized countries, there have been cases of monstrous homicidal insanity. Going a step further, we find the propensity to murder has been accompanied by cannibalism. There have been a great many cases in which the homicidal and cannibal craving has been accompanied by hallucinations. Many of the insane cannibals described by Mr. Baring-Gould thoroughly believed themselves to have been transformed into wolves or other wild animals. Even in our own day the idea has not entirely died out of the French peasant's mind. A little over thirty years ago Mr. Baring-Gould was unable to persuade a peasant to guide him across a wild place after dark, because it was haunted by a werewolf. The theory of werewolves was the attempt of the cultured people of the Middle Ages to explain the obscure phenomena of insanity.

When, in those times, a person fell in a fit they shouted, "He's struck with a fairy dart," whereas we exclaim, "epilepsy."

Our modern word nightmare is the survival of a medieval theory of a female demon who sits upon one's bosom and hinders respiration. We moderns may say "indigestion," but they exclaimed "night demon," or *Night Mare*.

The relation of morbid imagination to myth, combined with crude reasoning by analogy, is illustrated not only in the terrible theory of werewolves, but in the well known disease called by the English name of shingles, from the Latin word *Cingulum*, a girdle. This well-known irritating herpetic disease tends to encircle the body as with a girdle. Tylor says that, by an imagination not difficult to understand, this disease is attributed to a sort of coiling snake; and that he remembered a case in Cornwall where a girl's family waited in great fear to see if the creature would stretch all around her, the belief being that if the snake's head and tail met, the patient would die.

That primitive philosophy of nature in which all forces objectively existing are conceived as identical with the force subjectively known as volition, is interestingly illustrated in the superstition that harm is sure to come to him who saves the life of a drowning man. This superstition is a survival in culture. In the older form of the belief it is held that the rescuer will sooner or later be drowned himself; and thereby we pass to the fetichistic interpretation of drowning as the seizing of the unfortunate person by the water-spirit, who is naturally angry at being deprived of his victim, and henceforth bears a special grudge against the bold mortal who has thus dared to frustrate him. Again, it is still believed by some venerable granny that it is wicked to kill robins. At an earlier date the superstition assumes the shape of a belief that the killing of a robin portends some calamity; in a still earlier form the calamity is specified as death; and again, still earlier, as death by lightning. Another step backward reveals that the dread sanctity of the robin is owing to the fact that he is the bird of Thor, the lightning god; and finally we reach that primitive stage of philosophizing in which the lightning is explained as a red bird dropping from its beak a worm with the power to cleave even rocks.

Centuries ago, the Portuguese in West Africa, noticing the veneration paid by the negroes to certain objects, such as plants, pebbles, idols, claws of beasts, etc., very fairly compared these objects to the talismans and amulets with which they were themselves familiar, and called them *feitico* (meaning a charm), whence we get our English word fetich. Fetichism was universal in the primeval world. These primitive philosophers, reasoning with reckless analogy, believed that all sorts of spirits could reside in these objects—the kindly, helping spirits of powerful ancestors, as well as those of enemies. They were exorcised or appealed to, therefore, in multitudes of ways.

Referring to fetiches, Pliny informs us how pains in the stomach may be cured by transmitting the ailment from the patient's body into a puppy or duck, which will probably die of it. After the birth of a Chinese baby, its father's trousers, used as a fetich, are hung in the room upside down, so that all evil influences may enter into them instead of into the child. Modern folklore still cherishes such ideas. Although the terrible "black witchcraft" has died out from modern civilization, anthropologists may still study in the "white witchcraft" of modern European peasants the arts of curing a man's fever or headache by transferring it into a bird, or a crawfish, or of getting rid of ague or warts or gout by giving them to a willow, fir or ash tree with suitable charms. In England, warts may be touched each with a pebble, and the pebble in a bag left on the road to church, to give up their ailments to the unlucky finder; in Germany a plaster from a sore

may be left at a crossway to transfer the disease to a passer-by. In Thuringia it is considered that a string of rowan berries, a rag, or any small article, touched by a sick person and then hung on a bush beside some forest path, imparts the malady to any person who may touch this article in passing, and frees the sick person from the disease. It is stated on medical authority that the bunches of flowers which children offer to travelers in Southern Europe are sometimes intended for the ungracious purpose of sending some disease away from their homes.

Apart from the wretched selfishness and immorality of such practices, do they not help to furnish an insight into the human mind? Do they not prove, along with much that has been said in this paper, that there are inherited tendencies, and that there may be atavisms tucked away in the recesses of the average human mind, that may, under certain circumstances, render them susceptible to almost any kind of vagaries, and therefore to vagaries and charlatanry in medicine? The circumstances may be ignorance, wasting diseases that impair the better faculties of the mind, a poor mental inheritance, an unpropitious environment, or, as I have already intimated, reversions to primitive methods of philosophizing.

Can one detect any great difference between the personifications of the forces of nature by primitive men and the views of nature held by the most learned persons in the fifteenth, sixteenth and seventeenth centuries throughout Christendom? Catholics and Protestants alike believe that there was diabolical agency in storms, pestilence, insanity, and in fact in all disease. Martin Luther supported the theory most zealously, frequently asserting his belief that the winds themselves were only good or evil spirits. Moreover, we find Luther deliberately asserting that a stone thrown into a certain pond in his native region would cause a dreadful storm because of the devils kept prisoners there. The childish remedies employed against diabolical agency in the air and against pestilence were exorcism, fetiches of various sorts, ringing of church bells, parades carrying saints' relics, etc.

But have we not with us in modern times large numbers of persons wearing "electric" belts and "magic" foot-pads in the same fetichistic frame of mind?

In our own time West Africa is still a world of fetiches. The traveler finds them on every path, at every ford, on every house-door; they hang as amulets around every man's neck, they guard against sickness or inflict it if neglected, they bring rain, they till the sea with fishes willing to swim into the fisherman's net, they catch and punish thieves, they give their owner a bold heart and confound his enemies; there is nothing that the fetich cannot do or undo, if it be but the right fetich. On the theory of inherited fetichistic instincts the usefulness of the

placebo in medicine and the success of patent medicines may be due at times to something other than the power of suggestion.

Thus the one-sided logic of the barbarian, based upon careless reasoning by analogy, making the most of all things that coincide with his primitive philosophy, and glossing over all that fails, has shaped a universal fetich-philosophy of the events of life. So strong is the pervading influence, that the European in Africa is apt to catch it from the negro, and himself, as the saying is, "become black." Thus, even to this day some traveller, watching a white companion asleep, may catch a glimpse of some claw or bone or such-like sorcerer's trash secretly fastened around his neck.

Modern European life shows well-marked traces of the ancient science and philosophy of spirits or mysterious influences inhabiting objects. The Tyrolese object to using grass for toothpicks because of the demons that may have taken up their abode in the straws. The Bulgarians hold it a great sin not to fumigate the flour when it is brought from the mill (particularly if the mill be kept by a Turk) in order to prevent the devil from entering into it. Amulets are still carried in the most civilized countries of the world by the ignorant and superstitious, with real savage faith in their mysterious virtues, and by some enlightened person in what seems to be more than a quaint survival from the past. Certainly in all these persons who are found in modern life, and wherever found, we have the intellectual foundation for the reception and the encouragement of all sorts of aberrations in medical practice and medical belief. It is the writer's deliberate conviction that multitudes of worthless proprietary medicines and mechanisms, that are sold throughout the civilized world, would go out of existence were it not for the fetichistic taint that survives in so many persons' minds. The stupendous sales of so much worthless trash in the name of medicine cannot be accounted for on the grounds of mere ignorance. For where is education more generally diffused than in the United States? And where do quackery and charlatany in medicine find a greater paradise?

Nor could the tremendous force of suggestion, as met with in the innumerable advertisements in newspapers and printed circulars, accomplish so much harm as they undoubtedly do, were it not for that bias in so many minds that has its foundation in the depths of primeval philosophy.

Let us glance for a moment at fetichism in high places and among the educated in mediæval and modern times. You can go to the cathedral at Cologne, Germany, and observe the relics of saints there which are believed to have healing properties, or you can study the faith cures of Boston, or Old Orchard in this country. You can investigate the efficacy of the royal touch in sundry diseases, commencing with

Edward the Confessor, in the eleventh century, and come down from reign to reign until you arrive at Charles I of England, who enjoyed the same power, in spite of the public declaration against its reality by Parliament. In one case this king saw a patient in the crowd, too far off to be touched, and simply said, "God bless thee and grant thee thy desire"; whereupon the blotches and humors disappeared from the patient's body and appeared in the bottle of medicine which he held in his hand; at least so says Dr. John Nicholas, Warden of Winchester College, who declared of his own knowledge that every word of it was true, which only goes to prove how easy it is to get some good and well-educated persons to believe in the most absurd fetiches and fictions in medicine—characteristics of the human mind which permit the charlatans to grow as the green bay tree. But Lord Bacon himself has said that "Imagination is next of kin to miracle—a working faith." So great fetichistic powers were attributed to King James II of England that we find a pauper at Portsmouth, New Hampshire, in colonial times, petitioning the General Assembly to enable him to make the voyage to England in order that he might be healed by the royal touch.

In conclusion, how can the public be safeguarded against evil suggestions in medicine, against reasoning by analogy about medical subjects in normal moderns, and against reversions to primitive methods of philosophizing when dealing with accidents and disease? The writer must confess that he sees no way whatever to prevent mental atavisms any more than physical ones. Reasoning by analogy can be curtailed, probably by education, especially an adequate education in the elements of the physical sciences, mathematics and logic. Several of the best remedies against the evils of suggestion are systematic attempts in the private and public schools and the colleges throughout the country to inculcate a spirit of rational skepticism, not only towards extravagant and irresponsible claims in medical affairs, especially in printed circulars, magazines and the religious and daily papers, but also towards extravagant and unverified claims in any field of knowledge or venture. Another important antidote to suggestion is a systematic series of public lectures in the schools and colleges by entertaining talkers giving an elementary presentation of the main features of the history of medicine, and especially of the history of charlatanry. Another most important aid is to uphold and encourage such papers as the *Ladies' Home Journal* and *Collier's Weekly*.

But the writer must confess that no matter how brilliant the conquests of medicine in the future may be, no matter how careful and considerate and well informed physicians may become, and no matter how much logic and mathematics and medical lectures are given to the public, the charlatans and their dupes, like the poor, will always be with us.

ABSTRACTS AND REPORTS.

I. DIET IN TYPHOID FEVER. (FISKE FUND PRIZE
ESSAY, 1907.)

This paper is an effort to work out the theoretical basis and the proper practice of feeding in typhoid fever. In it is developed and presented the view that the dietetic regimen now prevalent for typhoid-fever patients is needlessly and harmfully restricted, that the objections to and fancied dangers of a mixed diet are groundless and mythical, and that these patients should receive a more generous and more varied diet than is now allowed.

The history of feeding fever patients is reviewed, for the purpose of showing that the fear of soft and solid food in fever is a surviving vestige of the antiphlogistic doctrines of the medieval period; and also to show the empirical way in which the present methods have developed.

From a consideration of the data afforded by published metabolism studies in typhoid fever the essential nutritive requirements of an adequate diet for this disease are tentatively fixed at about 100 grams of proteid and 1800 calories of total energy daily for a medium-sized subject.

The data available as to the digestive powers during typhoid fever are then discussed, from which it appears that the digestion of proteids and fats during the febrile period is reduced only 5 to 10 per cent from the normal, a reduction far less than has been generally supposed, on the basis of vague impressions and dogmatic assumptions, to be the case. This degree of digestive power is amply sufficient to enable the patients to assimilate a generous amount of food.

The various possible injurious effects of improper feeding in this disease are discussed, as with reference to the production of gastric and intestinal indigestion, aggravation of the ulcerated conditions, the effect of diet on the temperature, and its relation to relapses and coagulation of the blood. A comparison of the customary diet with the dietary advocated is made with regard to these points, and reasons are presented for the claim that as much harm, and even more, can be brought about by the improper use of milk and soup as by any other food.

The availability of the various food articles for typhoid feeding is discussed and an ample and varied diet list presented, including milk, eggs, puddings, meats and similar articles, from which selection can be advantageously made.

The results and statistics of the actual employment of the generous and varied diet by clinicians in all parts of the world are presented, showing the safety and advantages of its use, in contributing to the

comfort and contentment of the patients, in shortening the period of convalescence, and above all in maintaining the patients' strength and resisting power at a maximum so as apparently to be capable of effecting a distinct lowering of the death rate from the disease.

JOHN BENJAMIN NICHOLS, M.D.

II. A NEW METHOD OF PERFORMING ARTIFICIAL RESPIRATION ESPECIALLY APPLICABLE IN CASES OF DROWNING.¹

The importance of prompt aid in cases of asphyxia from any cause or causes cannot be overestimated, and any new or improved method for bringing back to life these individuals should have a careful trying out and should be exclusively employed for this purpose if it be found to have distinct advantages over the older methods. It is the purpose in this paper to describe a method that has recently been devised by Professor E. A. Schäfer, of Edinburgh, which from the description and demonstration on normal subjects appears to have many advantages over the older methods.

In the case of a drowned person, immediately after being taken from the water, the patient is placed prone on the ground. The head is allowed to fall forwards and somewhat sideways. The mouth is open and the tongue naturally protrudes from the mouth. No manipulation of the tongue is necessary. The operator kneels by the side of or across the buttocks of the patient, places his hands flat upon the back over the lowest ribs and with the weight of his body presses firmly and gradually so as to expel the contents of the lungs. On relieving the pressure, which is done by the operator slowly swinging his body up without removing the hands from the back, the chest of the patient resumes its former dimensions and fresh air is drawn into the lungs. The alternate pressure and relief is repeated about once every five seconds, not oftener. The amount of air that can be introduced into the lungs in this way, by the pressure transmitted to the chest and abdomen and then by the release, is never less than 500 c.c., and may attain 1000 c.c. or more each respiration. By repeating the movements twelve times a minute an air exchange of from 6000 to 12000 c.c. can readily be effected. This is more than enough to maintain efficient respiration. On the passive living subject Professor Schäfer demonstrated this at the meeting of the International Physiological Congress, and it is easy for anyone to prove by the use of a proper face mask and spirometer. Professor Schäfer strongly urges that the movements of pressure be made slowly, and *not more often* than once in five seconds. Ten movements a minute will be ample for all purposes.

The usual method employed for resuscitation, that of Howard, is

¹ Read before University Medical Society, Oct. 19, 1907.

not so good as the method advocated by Schafer and it has the following disadvantages. (A) With the patient lying on the back the tongue tends to fall towards the pharynx and to block the passage of air. (B) Water and mucus tend to accumulate at the back of the mouth and in the pharynx and thus to close the air passages. (C) When the pressure is exerted upon the front of the ribs there is the risk, especially in elderly subjects, of fracturing the lower fixed ribs, with a resultant traumatic pneumonia in case the individual recovers from the asphyxia. (D) In cases of drowning the liver is greatly congested and if much pressure is exerted upon this region there is danger of producing rupture of the liver, with no chance of the patient's recovery.

The carrying out of the new method of Schafer is less fatiguing to the operator than that of the older methods, such as the Silvester, the Pacini, and the Marshall Hall. With the methods just mentioned it has been found impossible to keep up artificial respiration in a normal but passive subject for any length of time on account of the discomfort and the relative inefficiency of the air exchange, whereas by the new method artificial respiration has been maintained in a passive normal subject for as long as an hour without any fatigue on the part of the operator and without any "air hunger" on the part of the subject.

It is easy to understand that the amount of air exchange by exerting the pressure on the back when the patient is in the prone position is much greater than that by pressure on the chest when the patient is supine. In the supine position part of the pressure is used to distend the abdomen, while with the prone position pressure is exerted over not only the chest but also the abdomen. In the latter method the lung air-space is decreased and increased (expiration and inspiration) much more than in the supine position because instead of having a descent of the diaphragm with the pressure there is an ascent. Comparative measurements on the passive living subject have demonstrated that for periods of time beyond two or three minutes the prone position gives better results than the supine position, although it has been found that with certain methods single measurements give better results than the method of Schäfer. It must be kept in mind, however, that in practising resuscitation it is not a matter of one or two or even a dozen movements. The most efficient method is the one that gives the best results for periods of time beyond ten minutes, for in some cases it is necessary to keep up the movements for an hour or two at a time.

The method has been tested with success in cases of drowning, and the demonstrations on the living subject impressed all with its simplicity and efficiency. Because of its obvious advantages the method should be given first place in courses of ambulance and "first-aid" instruction.

SHEPHERD IVORY FRANZ, Ph.D.

III. THE FUNCTIONS OF THE FRONTAL LOBES.¹

In his paper the reader first took up for consideration all of the important published work on the frontal lobes and considered the hypotheses that had been advanced to explain the functions of this region of the cerebrum. It was pointed out that the earlier investigators considered the frontal part of the brain "the seat of intelligence." Later observers and experimenters recorded facts that were interpreted in different ways according to the emphasis that was laid on the clinical or the experimental evidence. Three hypotheses were advanced at different times: (1) This region of the brain is motor in function, (2) it is inhibitory, and (3) it is the center for states of attention. More recently there has been a return to the earlier view, viz., that the frontal lobes are concerned with the so-called intellectual processes. The experimental and clinical evidence was considered in relation to each of the four hypotheses and the fourth was found to satisfy the facts better than any one or more of the other three. It was pointed out that the facts at hand did not justify a very strong assertion in this matter, and that the most recent attempts to minimize the importance of the right frontal region were not justified by the facts that have been reported. As a contribution to help solve the problem the results that were obtained after extirpation or destruction of the frontals in monkeys and cats were reported, and it was shown that with the employment of a new method it was possible to get data from animals comparable with results from man.

The results with the new method showed clearly—a thing not shown before—that there is a mental change in animals following the removal of the frontals, the change being the loss of certain newly-formed associations or habits. Associations of long standing were reported to be exhibited as well after as before the removal of the frontals, and this fact may account for certain negative results obtained by other investigators. The loss of the associations was shown not to be due to the general shock effects of the operation as such, and it was shown that the associations were not lost after destruction of certain other portions of the cerebrum. The animals that had lost certain associations were able to "relearn" the associations, and a few experiments were reported in which animals lost the associations after a second operation on the frontal region. Many of the animals that were used showed signs of metabolism disorders, but this matter was not carefully investigated.

It was pointed out that not only the frontal regions but also the posterior association areas are probably concerned in the mental processes of man and animals, but less is known about the parieto-occipito-temporal association area than about the frontal. The suggestion is

¹ Read before University Medical Society, April 20, 1907.

made that the frontal lobes are normally concerned with the production and retention of habits, and that the posterior association area may be likewise employed. The facts for the proof of the latter have not been sufficiently correlated, but as far as could be told at the time it appeared evident that the two areas are used for the formation of associations, the frontal area being concerned more with the motor part of the associational process, the posterior area with the sensory part. Until more data have been accumulated the differentiation in function between the anterior and posterior areas may be considered purely speculative, but it was hoped that some results in this line would be ready for publication within a year.

Those specially interested were referred for a full account of the experiments to the monograph published by the reader. (On the Functions of the Cerebrum—The Frontal Lobes. Science Press, New York.)

SHEPHERD IVORY FRANZ, Ph.D.

IV. CASE OF PYONEPHROSIS WITH SPECIMEN.

Mrs. I., age 55, married and the mother of six children. About two months after the birth of her first child, which occurred in July, 1874, she had a severe attack of cramps in the left side of her abdomen, which lasted for four or five days. In a few days a large swelling was noticed in the left lumbar region. This began to subside in a few days but never went away entirely. The pain and cramps subsided synchronously with the subsidence of the swelling. These attacks of cramps and severe pain occurred with the swelling at intervals of from six months to two years up to the last attack, which occurred November 4, 1906. She was always confined to her bed from one to two weeks whenever these attacks came on, but they never seemed to interfere with her general health, as she was a very robust and otherwise healthy woman and gave birth to six perfectly healthy children, and had no especial trouble during any of her pregnancies.

I have been familiar with her case for the past ten years, and have seen her in about six of these attacks. Sometimes the muscle spasm and pain were so great that I had to use morphine to relieve her, but never more than twice or three times during any one attack, and then not more than a quarter of a grain was ever given at a dose. In many of her attacks she would relieve the pain with hot fomentations and rest in the bed without sending for a doctor. She had become so well trained as to what to do that she would at once go to bed and resort to this treatment with the result of being out in a few days.

On July 26, '06, she was taken again with great pain and cramps which did not yield to her treatment, so I was sent for. On examination I found a large hard mass extending from under the floating ribs down into the pelvis, and extending over the median line at least two

inches. At that time she had no elevation of temperature. The usual treatment of hot fomentations did not relieve her, so morphia was resorted to.

On August 9, two weeks after the beginning of the attack, she had a slight chill which was followed by a temperature of 102 degrees. This was the only time I ever knew her to have a fever temperature in any of the attacks I had seen her in during the past ten years. She rapidly lost strength after this, her pulse became very weak and rapid, and she was quite delirious for about a week. At this time I had Dr. W. P. Carr to see her with me in consultation for his opinion as to the advisability of operating on her. Her condition at that time was so bad that he declined to advise operation; as a matter of fact both of us thought she had but a few days to live, and gave the family a very grave prognosis. She was treated expectantly with heart stimulants, whiskey was given freely with milk, which was about all of the nourishment she had. It was very difficult to nourish her, and but for the close attention of a most faithful and competent nurse, I am sure she would have died. This condition of affairs, with the temperature ranging from 101 to 103, continued for about ten days, when she began to improve slowly; at this time it was very evident the enlargement was decreasing in size and becoming much softer. From this time on her improvement was very rapid and by September 3 she was up, and within another week she was able to go out daily and to do light housework. I never saw one improve so rapidly in all of my experience and in a few weeks she was as robust as ever. She continued in perfect health until November 4, when she was again taken with one of her old attacks as usual. She at once went to bed and resorted to her hot fomentations, etc., but as the pain increased and she again noticed the usual enlargement, she sent for me. I at once arranged to have her transferred to the George Washington University Hospital for an operation, as her condition at this time I thought would justify it. This attack she said was more violent than any she had ever had, and on the second day her temperature rose to 103 degrees. She was very anxious to be operated on, as she said she knew she could not go through another such attack as the one she had had in the summer.

She was operated on by Dr. Carr on November 7. As neither Dr. Carr nor myself was sure of the diagnosis, believing that it was either an enlarged spleen, or a case of hydronephrosis, he made his incision just to the outside of the left rectus muscle, which was about the center of the enlargement. As soon as the abdomen was opened it was evident that it was a case of hydronephrosis. The sac contained at least a quart of fluid which at first ran clear, but was followed by a copious discharge of pus, and with the pus came a pear-shaped stone about the size of a bluebird's egg. The diagnosis was now very clear, that it

had been a case of intermittent hydronephrosis caused by the plugging up of the ureter with the stone, which obstruction was relieved whenever the distension was sufficient to dislodge the stone.

As no fever temperature had ever developed during any of the numerous attacks she had had during the thirty-two years of the existence of the hydronephrosis, it is very evident that no infection had ever occurred until the attack she had in July of this year. An examination of the specimen will show that very little normal kidney tissue remains.

The patient died on the third day after the operation from suppression of urine. The urinalysis before the operation showed a slight trace of albumen and some casts.

A. R. SHANDS, M.D.

V. PNEUMOCOCCIC PERITONITIS.

C. B., male, colored, age 26; occupation, barber. Family history, negative. Previous history: Unimportant, except for attack of pneumonia, which he suffered two months ago, from which he has never completely recovered. Has had dyspnoea and severe pain in left side, which was increased by respiratory movements. Has been losing weight rapidly since attack.

Present illness: Began with sudden intense pain in abdomen, accompanied by marked dyspnoea, vomiting, and prostration. Facies drawn and anxious, abdomen distended and tympanitic, abdominal muscles rigid. Decubitus: dorsal, flexion. Pulse rate 108; respirations 22; temperature 98° F.; bowels, constipated. Examination of lungs reveals signs of consolidation over left lower lobe.

Urinary examination: Red blood-cells, leucocytes, and bacteria numerous; albumen present.

Diagnosis: Peritonitis—probably tubercular.

Exploratory laparotomy indicated. Operation: Long incision, left rectus, umbilicus to pubes. Entire viscera carefully examined with negative results as to etiology of peritonitis. The appendix, although perfectly normal, was removed. Peritoneum diffusely covered with serofibrinous exudate, which was partially removed and entire cavity irrigated with physiological saline solution. Cultures made from peritoneum. Reacted slowly from anaesthetic and complained of great thirst and singultus.

On the following day the patient was somewhat improved. Conjunctivae slightly icteroid; respirations shallow; rate 36; pulse rate 108-120, feeble and compressible; temperature 96.4° F.; examination of sputum for B. Tuberculosis negative. Patient became progressively weaker, and death occurred four (4) days post-operative.

Necropsy: Wound gangrenous; dense adhesions about intestines; no union whatever; culture from peritoneal fluid; liver pale and soft, cuts easily, slightly enlarged and bile stained; culture from liver;

dense adhesions around entire viscera; spleen much enlarged; culture from spleen; left lower lobe lung congested; bronchioles and alveolae filled with a muco-haemorrhagic material; pleura thickened and densely adherent; slight effusion.

Cultures: Bullion: Growth very slow and unsatisfactory; slightly cloudy and gives off odor.

Gelatin: Growth luxuriant; small bluish-white, rounded, elevated spots scattered diffusely over surface.

Milk: Coagulated.

Morphology: Non-motile organism occurring as small cocci usually in pairs, but a few chains were observed with and without capsule. The organism was recognized with difficulty until capsule was demonstrated by acetic acid and Gram's method.

Staining peculiarities: Stained with all the ordinary aniline dyes and shows capsule by acetic acid method.

Bacteriological conclusions: Incipient pneumonia with delayed resolution, followed by pneumococcal septicaemia and invasion of peritoneum.

GLENN I. JONES, M.D.

VI. AN ABDOMINAL WOUND WHICH OPENED UP ON THE ELEVENTH DAY.

Mrs. C. P., white, female, aged 39, widow. I was called to see her at her residence on February 2, 1907, when I secured this history: Excessive bloody flow from the uterus, which had been constant for the past two weeks. She was violently opposed to an examination and begged to be given a trial on some medicine before submitting to one. She was given fluid extract of ergot, grs. xv, every three hours and told to inform me as to the result in forty eight hours. At this time I was again called and found the flow was more excessive. The family history was negative, previous history, good. Menstruation began at fifteen and was normal, lasting from three to five days; she was married at twenty-two; she had one pregnancy and normal labor at twenty-four.

About two years ago it was noticed that the flow, while recurring regularly, was more profuse and lasted from five to seven days. She attributed this to worry over the death of her husband and business affairs. During the last three or four months has had more or less vaginal discharge, very offensive in character.

On January 22, flow began and has continued to this date, February 4. At this time she was much alarmed because of excessive flow and submitted willingly to an examination. The body of the uterus was found to be symmetrically enlarged and boggy, the cervix lacerated, indurated, and bleeding easily. There was a bloody discharge from the uterus.

Appendages appeared to be normal. Strongly suspecting carcinoma, I advised radical operation to be performed as soon as possible. To this the patient agreed. She entered George Washington University Hospital on February 7. At this time the blood examination showed four million four hundred and ten thousand reds, ten thousand six hundred and sixty leucocytes, 100 per cent hemoglobin. Examination of the urine showed it to be normal, except for the high specific gravity, 10.33, although the patient drank large quantities of water. On February 9, a combined vaginal and abdominal hysterectomy was performed. Clamps were left upon the uterine arteries and the vaginal vault, closed about them with catgut. Silk was used in the abdomen. The peritoneum and fascia were closed with continuous sutures of No. 2 catgut, and the skin with interrupted silkworm gut. Post-anaesthetic nausea was marked during the first thirty hours; clamps were removed on the third day and the patient established what appeared to be a good convalescence. On the eighth day the abdominal dressings were removed and the wound appeared to be in excellent condition, so the skin sutures were removed. All appeared to be going well until the eleventh day, when I was called in a great hurry to see her. I found to my great surprise that while using the bed pan the entire wound had opened up, the intestines being exposed and lying loose upon the abdomen. The house staff had bathed off and replaced the exposed bowel, and applied appropriate dressings. The patient was at once anaesthetized that the wound might be closed. Apparently there had been no union at all of the subcutaneous tissues, the omentum being adherent to the peritoneum, muscles and skin. It was found necessary to dissect out and ligate off quite a mass of omental tissue before the wound could be closed. The wound was closed with through-and-through mattress sutures of heavy silver wire. On the twenty-first day (the tenth day after re-closure) the patient developed phlebitis of the left limb, there being marked tenderness over the femoral vein but the pain most severe along the posterior tibial vein. On this day the abdominal sutures were removed but not until after phlebitis had appeared. Except for the phlebitis the patient made a good recovery and was discharged on the thirty-fifth day.

I have seen several cases where the abdominal wound had opened up some days after operation but never one which occurred so late as the eleventh day. It is my opinion that in this case the sutures of catgut in the peritoneum and fascia gave way at the time of the post-anaesthetic nausea and that the omentum at that time was forced up into the wound. That it had been there some days was shown by the adhesions.

The pathological report was made by Dr. D. W. Prentiss, who found the specimen to be non-malignant.

A. BARNES HOOK, M.D.

VII. METHOD OF LOCATING SURGEON'S WOUND UNDER PLASTER CASTS.

The application of a cast frequently covers a wound that the surgeon has made for the purpose of wiring, resection, or other operations upon bone. In order to insure a snug, strong cast the incision cannot be left exposed. So too, when the wound is to be dressed, the smallest window compatible with cleanliness will maintain the greatest rigidity. The size of the window bears an inverse ratio to the strength of the cast.

It has been my experience, actual and from observation, that a wound completely covered with plaster is difficult to locate with exactness, and the least amount of window cutting. Our landmarks are obscured in a hard white envelope, and the fenestra is made from memory. We not infrequently see casts so damaged from large, unnecessary windows, that the remaining isthmus is unable to withstand the strain, the plaster becomes pulverized along a line of greatest tension with only the crinolin left for support, allowing a free, hinge-like movement. In order to remove the minimum of plaster, it has been my practice in the last few months to employ large brass rug tacks, a head about $\frac{3}{4}$ inch in diameter, and steel point about $\frac{1}{4}$ inch, sterilized and placed at each end of the wound, upon the layer of gauze next to the skin. Gauze and cotton can be applied above this, the point easily penetrating. The cotton batting and plaster bandage are used in the ordinary way, care being taken that the tack pierces each layer as it covers it. When the cast is completed we have one steel point at each end of the wound, projecting from $\frac{1}{8}$ inch to $\frac{1}{2}$ inch, depending on the thickness of the dressing and cast. The points are afterward covered with corks or beeswax. Should the points project in such a region that the elevations would be objectionable, I would suggest that the tacks be previously heated over a gas flame to remove the temper and the points turned down with forceps after the cast has hardened; the tacks can be used repeatedly.

There are other ways of locating wounds under casts, but none, to my knowledge, that is so simple and exact, and that preserves the symmetry and beauty of a cast.

CHARLES S. WHITE, M.D.

VIII. CASE OF TYPHOID FEVER FOLLOWING EPIDEMIC INFLUENZA.

The following case is reported, not because of any peculiarity in the two diseases, but more because of the rarity of their sequence.

The history of the case is as follows:

Mrs. D. M. M., age 28, married, social condition good. Family

history: Father died age 78, cause unobtainable, mother died at age of 57, with tuberculosis. Two brothers died with tuberculosis of lungs in early manhood. One sister died in early womanhood, with tuberculosis of lungs.

Previous history: Patient, while not robust, had never had a serious illness.

Present illness: Began suddenly January 1, 1907, with chilly sensations, headache, pains in the back and extremities, anorexia and a sense of fever. With the development of a slight cough the above symptoms had continued up until the morning of January 3, when I first saw the patient. A tentative diagnosis of influenza was confirmed by subsequent observation. The patient's condition gradually improved during the following ten days.

I was again summoned to see the patient on January 21, 1907. The subsequent cause of the condition showed a typical attack of enteric fever in every respect cardinal symptoms were all present. Epigastric pain, rose spots, coated tongue, fetid breath, enlarged liver, and spleen, widal reaction and leukopenia. The temperature curve as shown by morning and evening chart was characteristic. There was associated with the enteric infection an excessive catarrhal condition of the respiratory tract, the bronchitis being apical rather than basal, a condition that for some days considering the strong family history of tuberculosis, caused me no little uneasiness. There was, however, a perfect recovery.

EDGAR P. COPELAND, M.D.

IX. ANOMALIES OF THE ENCEPHALIC ARTERIES AMONG THE INSANE.

An important paper from the pen of Professor I. W. Blackburn on "Anomalies of the Encephalic Arteries Among the Insane" is to be found in a recent number of *The Journal of Comparative Neurology and Comparative Psychology*. In this article Doctor Blackburn has described all the anomalous conditions of the arteries of the Circle of Willis in a series of two hundred and twenty consecutive autopsies, of which number only sixty-five showed no anomaly. Each of the main arteries are considered separately and statistics are given of the frequency of anomalous conditions in it. Three cases are reported at length, forty are given briefly, and there are illustrations of nineteen of the most striking abnormal arrangements of the arteries. Although primarily anatomical in scope the article contains much material that the physiologist, the neurologist and the surgeon should keep in mind. It is hoped that Doctor Blackburn will amplify in another article his general remarks on the mechanics of the cerebral circulation, and that

he will also publish in an appropriate journal a correlation of the anomalous arterial conditions with the pathological changes in the cerebrum and cerebellum.

X. KING'S MANUAL OF OBSTETRICS.

The recent, the tenth, edition of Dr. A. F. A. King's Manual of Obstetrics has been received with as many expressions of approval as were the earlier editions. Some of the errors of the previous edition have been corrected and some of the older methods omitted. The chapters on fecundation and nutrition of the embryo have been largely rewritten and there have been extensive changes in the chapters on pelvic deformities, cutting operations on the mother, mutilating operations on the child, placenta previa, and puerperal septicemia. Many new cuts and three colored plates have added to the presentation of the subject. Of the book *The New York Medical Record* says: "It is characterized by accuracy, brevity and simplicity of statement. Many generations of students have found this book to be a most reliable guide and it can still be recommended as probably the best small book on the subject." *The Virginia Semi-Monthly* says: "It covers every essential, practical part of obstetrics. It would be difficult to suggest any eliminations in the text." The reviewer in *The American Journal of Medical Sciences* writes: "It is a pleasure to commend a work which in addition to the dignity and authority of age, exhibits also the freshness of rejuvenescence."

XI. NEW METHODS OF VERSION IN TRANSVERSE PRESENTATION.

As a science and as an art obstetrics is considered by most medical practitioners to be in a position similar to anatomy, that all of the important matters have been discovered, and that only the finer points need to be worked out in more detail. That careful observation and acuteness of reasoning in such a practice as obstetrics will be the means of discovering and applying new facts and of devising new methods is well shown by a recent paper by Dr. A. F. A. King, in which he describes a new method of delivery in cases of transverse presentation. The advantages of the new method are so obvious after one has read the article that it occasions surprise that it was not described or thought of years ago. For the proper appreciation of the matter the whole article should be read by all who have any obstetrical practice. The method was described before the recent meeting of the American Gynecological Society in Washington, was well received there and later a very complimentary editorial account appeared in the *New York Medical Journal*. The paper is entitled "New Methods of Version in Trans-

verse Presentations," and is published in full in the August number of *Surgery, Gynecology and Obstetrics*. The article is illustrated by seven figures which not only greatly help in the understanding of the method but which prevent any misunderstanding.

XII. PRESENT DAY THEORY OF PULMONARY TUBERCULOSIS.

Dr. B. M. Randolph has an important resumé of the present day therapy of pulmonary tuberculosis that should have a wide circulation, (*New York Medical Journal*, September 1, 1906). In the article Dr. Randolph discusses the methods that are employed in these cases, and discusses at some length (1) rest, (2) pure air, (3) food, and (4) drugs. On the fourth topic it is stated that the only drugs which are to-day generally prescribed, because the patient has consumption, are cod-liver oil and creosote. The cod-liver oil should, however, be considered more as an easily digested food than as a drug. The creosote acts as a stimulant expectorant and at the same time it prevents dyspepsia, increases the appetite and in this way helps to keep up the general bodily health. It should be given in small doses, it is said, and not to the limit of tolerance on account of its deranging effect on the gastro-intestinal tract. The author summarizes his paper as follows: "Every method of treatment of pulmonary tuberculosis, which has stood the test, has for its prime object the improvement of nutrition. We cannot become narrow advocates of any one remedy system or method, but owe it to our patients to employ every available means that will lead to improved nutrition. We must take into consideration every circumstance connected with each individual patient, and modify our remedies, both in their selection and application, according to the needs of the patient." As a general summing up he says: "Treat the patient and the patient will take care of the disease."

XIII. OBSERVATIONS OF OPSONIC THERAPY IN WRIGHT'S CLINIC.

At the meeting of the George Washington Medical Society, November 16, 1907, Dr. John Benjamin Nichols gave an account of personal observations of opsonic therapy in the clinic of Sir Almroth E. Wright, at Saint Mary's Hospital, in London.

A year ago great interest was aroused in America by the addresses given by Dr. Wright on the opsonic theory and practice developed by him and his collaborators. This was followed last spring by a series of papers by American workers who for the most part had failed to obtain the results claimed by Wright and condemned and criticized his methods.

Under these circumstances, with enthusiastic claims on one side, and disparaging criticisms on the other, Dr. Nichols spent several weeks in the summer of 1907 in the clinic and laboratory of Dr. Wright, as well to observe the actual clinical results obtained by the ingenious originator of the method as to acquire the technique. The presentation of the observations thus made was the purpose of Dr. Nichols's report.

He gave an account of the materiel, the personnel, and the general methods and conduct of Dr. Wright's establishment. Large numbers of patients were observed under treatment, reporting ordinarily at the clinics every ten days. The particular forms of disease adopted to the treatment are chronic localized infections caused by any cultivable bacteria. The great majority of the patients were cases of localized tuberculosis, especially of the glands, joints, skin, and bladder. The remaining patients were those with infections of staphylococci (acne, furunculosis, carbuncle), colon bacilli (cystitis), streptococci, pneumococci, gonococci, nasal infection, etc. Many of the cases were of the most obstinate character, in which after all other therapeutic resources were exhausted in the skin, surgical, and other clinics of London the patients were sent as a last resort to Wright's service. Whatever results could be obtained in such desperate and refractory cases were all pure gain. While some cases did not show much effect from the inoculations, yet in many the treatment undoubtedly produced improvement and cure, and in some the results were really brilliant.

The principal controversy in this matter centers around the accuracy, the significance, the usefulness, and the feasibility of determinations of the opsonic index. As to accuracy, the workers in Wright's service seemed to be able to obtain consistent and agreeing results within a margin of variation small enough to be negligible. Some of the critics of Wright's methods exhibit an unfamiliarity with many of the minute details which are essential to reliability and accuracy; or are led astray in the effort to introduce innovations and "improvements" of the technique. As to the significance of the opsonic indices, the whole theory and practice of inoculation therapy as elaborated by Wright was based on these determinations. As to their usefulness, Wright, with all his clinical experience along this line, professes that he needs the information afforded by them as an aid in diagnosis and control of the treatment, and goes to much labor and expense to procure them. While in strictly chronic cases in which the inoculations do not have to be pushed, the course of the antibacteria activities can be largely "visualized," and the determination of the opsonic indexes as a control for every individual injection may perhaps be largely dispensed with or replaced by clinical observation, yet for certain diagnostic purposes,

and as a guide to inoculation in acute septic cases, reliance on opsonic estimations will be necessary.

As the result of his observations, Dr. Nichols believed that the conclusion was justified that in the class of cases to which it is adapted, chronic localized infections due to the tubercle bacillus, staphylococcus, streptococcus, pneumococcus, gonococcus, colon bacillus, micrococcus catarrhalis, etc., and perhaps some acute septic conditions—controlled when necessary by opsonic determinations, the inoculation of stock or autogenous bacterial "vaccines" is a therapeutic agency of distinct efficiency and promise, either in association with other therapeutic measures or in cases after all other procedures have failed; and that it is a specific and curative method in cases in which there is no other specific or definite mode of treatment available aside from symptomatic or palliative measures.

XIV. ETIOLOGY AND CLASSIFICATION OF FUNCTIONAL HEART MURMURS.

P. E. McDonnold, M.D. (G.W.U. '98). Passed Assistant Surgeon U. S. Navy, contributes in the U. S. Naval Medical Bulletin, Vol. I, No. 3, an interesting article on the so-called functional or accidental heart murmurs with special reference to their etiology and classification. Dr. McDonnold states that his attention was first called to the great frequency of the so-called functional murmurs while serving on the medical examining board for the examination of candidates for entrance to the Naval Academy during which time about 350 young men ranging from 16 to 20 years came before the board for physical examination. These examinations were held immediately after the mental examinations had been passed and as a result the candidates appeared before the examining board in a state of more or less physical exhaustion. They had not only been spending long hours in study, with consequent loss of sleep, and possibly the overuse of tobacco, but had been attempting at the same time to bring themselves up to the required physical standard by athletic exercises of various sorts. The excitement attendant upon the examination acted as an additional factor in the production of such a large number of functional heart murmurs that the members of the examining board came finally to expect a murmur rather than the contrary in every candidate who presented himself. The greater portion of these murmurs were systolic, with maximum intensity in the pulmonary area, but a number had their maximum intensity in the mitral or aortic areas, and they were accompanied at times by physical signs which made their differentiation from organic murmurs exceedingly difficult. This experience interested Dr. McDonnold in the significance of such murmurs, and in his paper he sum-

marizes the important literature on the subject with special reference to the frequency of heart murmurs and the causes to which they may be attributed.

Among the causes which have been suggested as being productive of functional murmurs, at times, are the following: Pressure on the pulmonary artery by the heart during systole, squeezing it against the chest wall as a result of the retraction of the lung from the base of the heart (Quinke); spasm of the columnae carneae, preventing perfect closure of the valves (Upshur); disproportion between the size of the ventricular cavities and the length of the chordae tendineae and musculi papillares (Bristowe); a lateral displacement of the origin of the musculi papillares on account of dilatation of the heart (*ibid.*); imperfect closure of the valves from rapid heart action or a disturbance of the pneumogastric nerve from gastric disorders (Conkling); a dilatation of the alveoli of the lungs from frequently holding the breath, as in heavy lifting or hard labor, accompanied by a temporary stagnation of the blood and its sudden release—this becoming a habit and inducing chronic changes (*ibid.*); a friction between the pericardium and the chest wall caused by a wrinkling of the former or by the "white patch" on the wall of the right ventricle (*ibid.*); pleuro-pericardial friction (Syers); pericardial and phrenic friction when the stomach is distended with gas (Root and others); palpitation of the heart from nervous causes (Allbutt); sonorous vibrations transmitted to the stethoscope by a peculiar ventricular shock at times, and, on other occasions, vibrations of the conus arteriosus of the right ventricle (Drummond). Finally, Davidson would explain all murmurs by vibrations set up in the valves of the heart by impact of the blood stream at an oblique angle.

Dr. McDonnold thus concludes his study: "We have seen that while these murmurs are functional in the sense of their not being due to organic valvular disease, a certain number of them are dependent for their production upon disease or debility of a more or less temporary character of either heart muscle, the tissues in immediate proximity to the heart, of the body elsewhere. It has been shown that a purely functional murmur, however, may occur at any point over the praecordia during comparative health, and that unless there are signs of cardiac enlargement, venous engorgement, or systematic disease coexistent with a murmur it cannot be taken as indicative of either organic heart disease or of serious ill health. The presence of a murmur therefore should merely put us on our guard as examiners and cause us to look for other signs which alone will determine the true significance of the sound."

W. F. R. PHILLIPS, M.D.

BIBLIOGRAPHICAL RECORD.

DECEMBER 1, 1906, TO DECEMBER 1, 1907.

This Bibliographical Record is the third annual Supplement to the University Bibliography, containing titles of books, monographs, papers, etc., published by members of the Faculty and Doctors of Philosophy, issued September 1, 1904. It embraces titles of publications by University instructors and graduates appearing during the past year, and complete lists of the publications of members of the Faculty whose names were not included in the Bibliography of 1904, or the 1905 or 1906 supplement. The abbreviations used are current in scientific publications.

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(1890-)

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- Assistant Editor of "Chemical Abstracts," in charge of abstract work on soils and fertilizers.

WHITE, WM. A., M.D., Professor of Mental Diseases (1903-).

- The nature of insanity. Wash. Med. Ann., Sept., 1907.
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WILLOUGHBY, W. W., Ph.D., Professor of Political Science (1907-).

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- Also numerous contributions to current periodicals.

UNIVERSITY APPOINTMENTS.

UNIVERSITY APPOINTMENTS.

DEPARTMENT OF ARTS AND SCIENCES.

FACULTY OF GRADUATE STUDIES.

Assistant Professor of Physics: **PERLEY G. NUTTING, Ph.D.**
 A.B., Stanford University, 1897; M.S., University of California, 1899; Whiting Fellow at University of Göttingen, 1901-1902; President White Fellow, Cornell University, 1902-1903; Ph.D., *ibid.*, 1903; Assistant in Physics, Stanford University, 1897-1898; Assistant in Physics, University of California, 1898-1901; Assistant Physicist, U. S. Bureau of Standards, since 1903; Member American Physical Society, Philosophical Society of Washington, American Association for the Advancement of Science.

COLUMBIAN COLLEGE

Professor of Zoology for 1907-'08: **C. DWIGHT MARSH, Ph.D.***
 A.B., Amherst College, 1877; A.M., *ibid.*, 1880; Ph.D., University of Chicago, 1904; Professor of Chemistry and Biology Ripon College, 1883-1889; Dean of Faculty, *ibid.*, 1900-1903; Acting President, *ibid.*, 1900-1901; Professor of Biology, Earlham College, 1904-1905; Expert in Poisonous Plant Investigations, Bureau of Plant Industry since 1905; President of Wisconsin Academy of Sciences, Arts and Letters, 1896-1899; Member of Board of Commissioners Wisconsin Geological and Natural History Survey, and Secretary of Board, 1897-1899; Biologist, *ibid.*, 1899-1904; Fellow American Association for the Advancement of Science, Member American Society of Naturalists, American Society of Zoologists, Botanists of the Central States, etc.

DEPARTMENT OF MEDICINE.

Professor of Bacteriology and Pathology: **JOSEPH J. KINYOUN, M.D., Ph.D.**

M.D., Bellevue Hospital Medical College, 1882; Ph.D., Georgetown University, 1894; Studied, University of Berlin, 1890-1891. Institute Pasteur, Paris, 1891 and 1894; Director Hygienic Laboratory, U. S. Marine Hospital Service, 1889-1899; Professor of Bacteriology and Pathology, Georgetown University, 1890-1899; Special Lecturer on Immunity Serum Therapy and Protective Inoculations, 1903; Member American Medical Association, Association of American Physicians, Association of Bacteriologists and Pathologists; Society of American Bacteriologists, The College of Physicians of Philadelphia, the Pathological Society of Philadelphia, American Public Health Association, the American Association for the Advancement of Science.

Assistant Professor of Pediatrics: **J. FREMONT SMITH, M.D.**
 A.B., Dartmouth College, 1880; M.D., University of Pennsylvania, 1883; Member New York Academy of Medicine, American Climatological Association, American Medical Association, American Association for Study and Prevention of Tuberculosis, Medical Society of the District of Columbia.

Assistant Professor of Surgery: **WILLIAM FRANCIS MATTINGLY SOWERS, M.D.**

A.B., Princeton University, 1806; M.D., Johns Hopkins University, 1900; Resident House Officer, Asst. Resident, Resident Surgeon, Assistant and Instructor, *ibid.*, 1900-1907.

* In place of Professor Paul Bartsch who is on leave of absence.

DEPARTMENT OF LAW.

Instructor in International Law: ELLERY C. STOWELL, A.B., LL.B.

A.B., Harvard, 1898; Studied, University of Berlin, 1903-1904; Graduated École libre des Sciences politiques (Section diplomatique), and licencié en droit, University of Paris, 1906; Secretary for the Delegation of Panama at the Hague Conference, 1907.

UNIVERSITY MISCELLANEA.

Dean Howard L. Hodgkins, of the Department of Engineering, attended the meetings of the American Association for the Advancement of Science, held in Chicago, December 30 to January 4.

Professor Mitchell Carroll attended the meetings of the American Philological Association and the Archaeological Institute of America, held at the University of Chicago, December 28-31. He has been granted a leave of absence by the University for the first ten days of January, that he may visit Denver and other cities in the interests of the Archaeological Institute of America.

Professor James Brown Scott, of the Department of Law, was tendered a dinner at the New Willard Hotel, Saturday evening, December 27, in recognition of his distinguished services as Technical Delegate of the United States to The Hague Conference. About 100 were present. Hon. H. B. F. Macfarland acted as toastmaster. Speeches were made by Ambassador Bryce, Hon. John W. Foster, President Needham, Professor Scott, and others.

Professor C. W. A. Veditz, during the Christmas holidays attended the meetings of the American Sociological Society, of which he is Secretary, at Madison, Wisconsin, and of the American Economic Association. Dr. Veditz has been made editor-in-chief of the quarterly periodical issued by the latter.

During the approaching summer, Dr. C. W. A. Veditz will be a member of the Summer School faculty at the University of Michigan. He will offer courses in theoretical and practical sociology and an advanced course in "Suicide."

Rev. Benjamin Alfred Dumm, Ph.D. (G.W.U., 1900), Pastor of the First Church, Stoughton, Mass., has recently conducted a series of conferences on "The Social Problem," under the auspices of the Woburn Association of Massachusetts.

We are in receipt of a paper read at a meeting of the American Brewing Institute, held at The Chemists' Club, New York City, entitled, "Improving the Quality of Domestic Hops," by W. W. Stockberger, Ph.D. (G.W.U., 1907).

Dr. H. L. McBain, Instructor in Political Science, will deliver a lecture at Richmond College early in January, on "The Teaching of Political Science in the South."

The Maryland Agricultural Experiment Station has published the thesis of Martin N. Straughn, Ph.D., 1906, as Bulletin 20, under the title "Sweet Corn Investigations."

We are in receipt of a copy of the "Report of the Board of Education of Summit, New Jersey," for the year ending June 30, 1907, by Louise Connolly (B.S., 1893, M.S., 1895, G.W.U.), Supervising Principal of the public schools of that city.

The Bureau of Standards of the Department of Commerce and Labor, has published as Reprint No. 64, the thesis submitted by Frederick W. Grover for the degree of Ph.D., June, 1907, entitled, "Simultaneous Measurements of the Capacity and Power Factor of Condensers."

Dr. Perley G. Nutting, of the Bureau of Standards, has been appointed Assistant Professor of Physics under the Faculty of Graduate Studies. His academic record appears elsewhere in this Bulletin. Since 1903, he has been Assistant Physicist at the Bureau of Standards, and is considered an authority on optics and spectroscopy. Dr. Nutting will conduct both theoretical and experimental work on spectroscopy.

The Classical Club will hold its eighth anniversary exercises on Saturday evening, January 4, 1908, in University Hall. Professor David G. Hogarth, Director of the Cretan Exploration Fund, and for some time Director of the British School at Athens, will give an illustrated lecture on "The Aegean and Crete."

Arrangements have been made by the University Debating Council for three intercollegiate debates. There is to be a return debate with the University of North Carolina, which met defeat here last year at the hands of the local university. The men who will represent the latter are J. M. Berry and E. G. Schreiber. The debate will take place at Chapel Hill, N. C., late in March.

The other debates are to be with the University of Pennsylvania and the West Virginia University, both probably in this city, one in April and one in May. It is understood that in addition to the debates with Pennsylvania, North Carolina and West Virginia, endeavors have been made to meet Virginia and Georgetown.

An article on the "George Washington University College of Engineering" appeared in the *Electrical World* of November 30, 1907. It describes particularly the laboratory facilities that have been added this fall, and calls attention to the efficiency of the teaching staff and the record made by its students.

Mr. Arthur P. Davis, Chief Engineer of the United States Reclamation Service and a graduate in civil engineering of the George Washington University, was elected President of the Washington Society of Engineers at the annual meeting on December 17. Professor Philander Betts, of the faculty of the College of Engineering was elected to the Board of Directors of the Society. This Society was organized in 1905, and has more than 300 members. The first president was Admiral C. W. Rac, Chief Engineer United States Navy and a trustee of the Washington College of Engineering. The second president, who has just retired from office, was Mr. F. H. Newell, Director of the United States Reclamation Service and also a trustee of the Washington College of Engineering.

George E. Myers, Ph.D., Lecturer on the History of Education, attended the meeting of the Association of Colleges and Preparatory Schools of the middle states and Maryland, held in New York during the Thanksgiving recess, and read a paper upon "Influence of Present Methods of Graduate Instruction Upon Teaching in Secondary Schools." Dr. Myers also addressed the meeting of the Federal Schoolmen's Club, of Washington, on December 8, upon the subject of "Certification vs. Examination for College Entrance." His remarks were followed by an unusually interesting discussion.

About January first there will be issued a text book of psychiatry by Dr. W. A. White, Professor of Mental Diseases and Superintendent of the Government Hospital for the Insane. The book is intended for the use of students in connection with the course of lectures and demonstrations that are given by Dr. White during the second semester. The announcement and table of contents indicate that the classification of mental diseases is somewhat similar to that of Kraepelin, and that more attention than is usual in such works is to be devoted to the practical examination of the insane.

The Division of Education has established a department library, which promises to be of great service in connection with the educational

courses. The library room is open throughout the day, and is conducted as a seminary reference library, although the privilege of drawing books for over night is extended to members of the educational classes. The history of education, general educational theory, the theory and practice of secondary and elementary education, methods of teaching special subjects, general and comparative psychology and child study, are all well represented. The reports of the Commissioner of Education, proceedings of the National Educational Association, and the current educational and psychological journals are also represented.

Dr. S. I. Franz, Professor of Physiology and Experimental Psychology, and Psychologist in the Government Hospital for the Insane, has been invited to deliver during the Christmas holidays two addresses at Toronto, and to demonstrate some methods of mental examination before physicians in the hospitals for the insane of the Province of Ontario, Canada. The topics of the addresses are "The Development and Needs of Modern Psychiatry" and "Problems and Recent Advances in the Study of Insanity."

Accounts of the main scientific and social proceedings of the recent International Congress of Physiology, at Heidelberg, and of Neurology, Psychiatry, Psychology, and Nursing of the Insane, at Amsterdam, have been written by Dr. Franz; a general account and comparison of the two congresses appears in *Science*, the important psychological papers are reported in the *Journal of Philosophy, Psychology and Scientific Methods*, and the neurological contributions of general interest are given in abstracts in *The Journal of Comparative Neurology and Comparative Psychology*.

Dr. William A. White, Professor of Mental Diseases, and Dr. Shepherd Ivory Franz, Professor of Physiology, attended the meetings of the First International Congress of Neurology, Psychiatry, Psychology, and the Nursing of the Insane, held in Amsterdam, September 27. Dr. Franz also attended the Seventh International Congress of Physiologists, in Heidelberg, August 12-16. Dr. White acted as representative for the United States at the Amsterdam Congress on a special board for the study of the etiology of insanity.

Several members of our Medical Faculty are participating in the preparations for the International Congress on Tuberculosis to be held in Washington, September 21 to October 12, 1908. Some of the most

eminent of the foreign investigators in the fields of medical research and public hygiene have accepted the invitation of the committee of arrangements to take part in the series of lectures that will be delivered during the sessions of the Congress. Among those who have expressed their intention to attend the Congress are Dr. R. W. Philip, of Edinburgh, founder of the first tuberculosis dispensary; Dr. Theodore Williams, of London; Dr. Arthur Newsholme, health officer of Brighton, England, director of King Edward's Sanitarium; Dr. C. H. Spronck, of Utrecht, Holland; Dr. Karl Turban, of Davos-Platz, Switzerland, the originator of the scheme generally followed at present for the classification of tuberculosis; Dr. Gotthold Pannwitz, of Berlin, secretary general of the International Conference on Tuberculosis; Dr. Emil von Behring, of Marburg, the originator of the diphtheria antitoxin; Dr. A. Calmette, director of the Pasteur Institute at Lille, France; Dr. Maurice Letulle, of Paris, secretary general of the last International Congress of Tuberculosis, and Dr. S. Kitasato, of Tokio, Japan, director of the Imperial Institute for the Research of Infectious Diseases.

The Congress will be divided into seven sections—pathology and bacteriology, over which Dr. William H. Welch, of the Johns Hopkins, will preside; clinical study of tuberculosis, presided over by Dr. Vincent Y. Bowditch, of Boston; surgery and orthopedics, Dr. Charles H. Mayo, of Rochester, Minn., president; tuberculosis in children, under the presidency of Dr. Abraham Jacobi, of New York City; hygienic, social, industrial and economic aspects of tuberculosis, Mr. Edward T. Devine, of New York City, president; state and municipal control of tuberculosis, under the presidency of Surgeon General Walter Wyman, of the United States Public Health and Marine Hospital Service, and tuberculosis in animals and its relation to man, Dr. Leonard Pearson, of Philadelphia, President.

The George Washington University Medical Society which was organized in 1905 is steadily growing in interest and effectiveness, and has entered upon its third year with an enlarged membership. It holds regular monthly meetings for the reading and discussion of papers and informal smokers follow the regular exercises.

The following is a list of papers read since October, 1906 up to the close of the year 1907:

1906

- Oct. 20. Tetanus. By Dr. H. S. Medford.
 Nov. 17. Cholelithiasis. By Dr. E. C. Prentiss.
 Dec. 15. Acute Glandular Fever. By Dr. Glenn I. Jones.

1907

- Jan. 19. (1) Biographical Sketch of Dr. Jesse Ewell, the first graduate of the Medical School. By Dr. Jesse Ewell, his grandson.
(2) Ten Years' Experience as an American Surgeon in China. By Dr. W. H. Dodson.
- Feb. 16. Tic Douloureux and Its Treatment by Deep Injections of Alcohol. By Dr. Wm. H. Syme.
- Mar. 23. The Routine Use of the X-ray in Fractures, with Stereopticon slides. By Dr. Chas. S. White and Dr. Thomas A. Groover.
- Apr. 20. (1) Sterility in the Male and Its Operative Treatment. By Dr. Francis R. Hagner.
(2) Functions of the Cerebral Frontal Lobes. By Dr. Shepherd I. Franz.
- May 18. Second Annual Meeting and Smoker, with Address by the President, Dr. J. W. Chappell.
- Oct. 19. (1) The history of the Medical School. By Dr. A. F. A. King.
(2) Observations on a Newly Reported Method of artificial Respiration. By Dr. Shepherd I. Franz. (This is the first time this method has been demonstrated before a medical society in this country.)
- Nov. 16. Observations of Opsonic Therapy in Wright's Clinic. By Dr. J. B. Nichols.
- Dec. 21. Manic Depressive Insanity. By Dr. Wm. A. White.

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Washington, D. C.
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June, 1907

May 27
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Division of Education.

Faculty.

CHARLES WILLIS NEEDHAM, LL.D. PRESIDENT OF THE UNIVERSITY

WILLISTON S. HOUGH. Professor of Philosophy, in Charge
of Division of Education

Ph.B., Ph.M., University of Michigan, 1884; student in the Universities of Heidelberg, Halle, Berlin, Paris, and Oxford, 1884-88; Assistant Instructor in Philosophy, University of Michigan, 1888-89; Assistant Professor of Philosophy, University of Minnesota, 1889-91; Assistant Professor of Philosophy, University of Minnesota, 1891-94; research, Bodleian Library, Oxford, and Royal Library, Berlin, 1894-98; literary work, New York, 1898-1901; Florence, Italy, 1901-02; London, 1902-04; Professor of Philosophy, The George Washington University, 1905-; in Charge of Division of Education, *ibid.*, 1907-; member, The American Philosophical Association, The Southern Society for Philosophy and Psychology; translator, Kuno Fischer's *Critique of Kant*, 1888; editor, the English Translation, Erdmann's *History of Philosophy*, 3 vols., 1889-90; 4th. ed., 1898.

WILLIAM CARL RUEDIGER. Assistant Professor of
Educational Psychology

Diploma, State Normal School, Stevens Point, Wis., 1897; Ph.B., University of Wisconsin, 1899; Ph.M., *ibid.*, 1903; Ph.D., Columbia University, 1907; teacher in graded school, 1893-94; high school, 1899-02; Assistant in Pedagogy, University of Wisconsin, 1902-03; Professor of Method, Montana State Normal College, and Assistant Superintendent of Public Schools, Dillon, Montana, 1903-05; Fellow in Education, Teachers College, Columbia University, 1905-06; Assistant in Psychology, Columbia University, 1906-07; Assistant Professor of Educational Psychology, The George Washington University, 1907-; author, *The Field of Distinct Vision*, 1907; contributor to educational journals.

ELMER ELLSWORTH BROWN.....Lecturer on Educational Theory
 Diploma, Illinois State Normal School, 1881; A.B., University of Michigan, 1889; Ph.D., University of Halle, 1890; Principal High School, Jackson, Mich., 1890-91; Acting Assistant Professor of Science and Art of Teaching, University of Michigan, 1891-92; Associate Professor of Pedagogy, University of California, 1892-93; Professor, *ibid.*, 1893-98; Professor Theory and Practice of Education, *ibid.*, 1898-1906; United States Commissioner of Education, 1906- ; member, National Council of Education (Pres., 1905); International Congress of Arts and Sciences, St. Louis, 1904; author, *Secondary Education*, in Monograph Series on Education in the United States prepared for the Paris Exposition, 1900; *The Making of Our Middle Schools*, 1903; *Origin of American State Universities*, 1905.

WILLIAM ESTABROOK CHANCELLOR.....Lecturer on School Administration and on Educational Theory.
 A.B., Amherst College, 1889; A.M., *ibid.*, 1895; M.D., Long Island Medical College, 1892; LL.B., Harvard Law School, 1895; Lecturer Brooklyn Institute, 1895-96; Superintendent of Schools, Bloomfield, N. J., 1897-1904; Paterson, N. J., 1904-06; Superintendent of Public Instruction, District of Columbia, 1906- ; Lecturer on Education, University of Chicago (Summer Quarter), 1907- ; Lecturer on Education, The George Washington University, 1907- ; author, *Mathematical Series* (10 vols.), 1902; *American History*, 1903; *Graded City Spellers*, (10 vols.), 1903; *Evening School Text-books*, (4 vols.), 1904; *The United States—A History* (with F. W. Hewes); 10 vols., Vol. I, 1901; Vol. II, 1905; *Our Schools, Their Administration and Supervision*, 1904.

GEORGE EDMUND MYERS.....Lecturer on the History of Education and on Manual Training
 A.B., Ottawa University, 1896; student at the University of Chicago, 1899-01; A.M., *ibid.*, 1901; Fellow in Education, Clark University, 1904-06; Ph.D., *ibid.*, 1906; teacher in secondary school, 1896-99; teacher and principal of High School, Colorado Springs, 1901-04; Principal McKinley Manual Training School, Washington, D. C., 1906- ; Lecturer on Education, The George Washington University, 1907- ; author, *Moral Training in the Schools*, 1907; contributor to educational journals.

WILLARD S. SMALL.....Lecturer on Child Study and on School Hygiene
 A.B., Tufts College, 1894; A.M., *ibid.*, 1897; student at Tufts Theological School, 1894-96; Scholar and Fellow in Education, Clark University, 1897-1900; Ph.D., *ibid.*, 1900; Honorary Fellow, *ibid.*, 1901; Professor of English, Lombard College; Professor of Psychology, Michigan Normal College; Supervisor of Training School, State Normal School, Los Angeles, Cal.; Superintendent of City Schools, San Diego, Cal.; Principal Eastern High School, Washington, D. C.; Lecturer on Education, The George Washington University, 1907- ; contributor to *Am. J. of Psychology* and *Pedagogical Seminary*; *Asso. Ed., Journal of Pedagogy*.

WILLIAM WESLEY BLACK.....Lecturer on General Method
and on Nature Study

Diploma, Indiana State Normal School, 1892; A.B., University of Illinois, 1898; A.M., *ibid.*, 1899; teacher in elementary and secondary schools; Superintendent of Public Schools; Head Critic, Illinois State Normal School, 1900-01; Head Critic, Chicago Normal School, 1901-06; Supervising Principal, Washington, D. C., 1906-; Lecturer on Education, The George Washington University, 1907-.

STEPHEN ELLIOTT KRAMER....Lecturer on Classroom Management

Diploma, Washington Normal School, 1890; B.S., The George Washington University, 1906; Instructor in English, Eastern High School, Washington, D. C., 1891-92; Principal of Smallwood School, 1892-99; Principal of Force School, 1899-1902; Principal of Franklin School, 1902-05; Director of Night Schools, 1903-05; Supervising Principal, 1905-; Lecturer on Education, The George Washington University, 1907-; contributor to educational journals.

For Members of the Faculty giving instruction in other than professional branches, see "Division of Education," in the Catalogue Number of the University Bulletin.

GENERAL STATEMENT.

In order to meet the local demand for the professional training of teachers, and at the same time to provide instruction in Education as a department of science, the University has established the Division of Education, with the expectation that the growth of the work will, in the near future, justify its organization as a Teachers College.

The aims of the Division of Education may, accordingly, be stated as follows:

- a. To promote the knowledge of educational science.
- b. To fit students for the higher positions in the public school service.
- c. To secure to teaching the rights and prerogatives of a profession.
- d. To aid in raising the standards of educational practice, and so to increase the efficiency of public education.

ORGANIZATION.

The courses of instruction in the Division of Education have been planned to meet the needs of two classes of applicants; first, undergraduate students who wish to combine a regular college course with thorough training for the profession of teaching; second, teachers in actual service, and others, who may desire to add to their professional qualifications by taking further special training. For the former, a

four years' course has been established, and denominated the Teachers Course. For the latter, provision has been made, first, by offering the greater number of the professional courses in the late afternoon, and on Saturday, so that they may be taken by persons engaged in teaching, or in the Departments of Government; and, second, by offering to teachers in actual service Scholarships of a value of one-third the regular fees, on conditions named below.

Opportunity is also offered to graduate students to pursue a major or minor in Education, leading to the granting of a Teacher's Diploma in conjunction with a Master's or a Doctor's degree. In this connection attention may be called to the exceptional facilities existing in Washington for graduate study particularly in the history of education in the United States. The extensive collections of the Congressional Library and the library and archives of the United States Bureau of Education furnish unrivalled opportunities in this department.

ADMISSION.

Applicants for admission as regular students, i. e., as candidates for a degree in the Teachers Course, must comply with the entrance requirements either for the Bachelor of Arts or for the Bachelor of Science Course in Columbian College (see pp. 37 and 38 of the Catalogue). But persons desirous of taking one or more of the professional courses, without becoming candidates for a degree, may be admitted as special students on the presentation of satisfactory evidence that they are qualified to pursue the work to advantage. Students already matriculated in Columbian College may be admitted to the Teachers Course, but not later than the beginning of their Junior year, unless by vote of the Faculty they be admitted at a subsequent period.

ADMISSION TO ADVANCE STANDING.

Students who have satisfactorily completed courses of study in other departments of the University, or in other approved colleges or universities, which may count toward graduation in the Teachers Course, will receive credit for such work on the presentation of certificates.

Graduates of approved Normal Schools, Training Colleges, or Technical Schools, and teachers of experience who have studied privately, will be admitted to such advanced standing as the courses they have pursued warrant.

THE TEACHERS COURSE.

The Teachers Course comprises the following educational divisions the two first made up of prescribed studies, the third of electives:

- a. A foundation of twenty-one units of general culture studies, prescribed in accordance with the view that a teacher's preparatory training should omit no one of the principal elements of culture.
- b. A minimum of nine units of professional training courses.
- c. Thirty elective units of special information courses and further training courses.

In recognition of the professional training, and of the completion of thirty instead of fifteen prescribed units of study, graduates from the Teachers Course will receive, in addition to the Bachelor's degree, a Teacher's Diploma.

A "unit" of study is one hour of recitation or lecture work per week for one academic year.

GRADUATION.

To be recommended for a Bachelor's degree in Arts or Science and a Teacher's Diploma, the student must complete courses of study aggregating at least sixty units. Thirty of these units are prescribed studies and thirty are electives. The prescribed studies are the following: (A) Either, in addition to the prescribed studies for the Bachelor of Arts Course, three units in Science and three units in History; or, in addition to the prescribed studies for the Bachelor of Science Course, three units in History and three units in Philosophy; (B) nine units in Education as defined in the introductory note, under "Courses of Instruction." The electives should be chosen with direct reference to the subjects which the student wishes to teach.

THE TEACHER'S DIPLOMA.

The Teacher's Diploma is granted in connection with either the Bachelor of Arts or the Bachelor of Science degree, upon the fulfillment of the following conditions: (a) the student must have satisfactorily completed the courses of study defined in the preceding paragraph; (b) he must, in the judgment of his instructors, also possess other qualifications essential to success in teaching.

The Diploma is also given in connection with higher degrees, provided a graduate student has taken a major or minor in Education, and has also satisfied the requirements a and b above, or, in lieu of a, has completed an equivalent amount of pedagogical and other work in another institution.

TEACHER'S SCHOLARSHIPS.

With a view to encouraging the continuous pursuit through a period of years of professional studies by teachers already engaged in teach-

ing, and further of enabling them to complete the professional requirements for a Degree and a Diploma without disproportionate expense, the University has established and offers to teachers in actual service Teacher's Scholarships of a value of one-third the regular fees, on condition that the holder shall complete six units in Education within three years or less, or nine units within four years or less. Application for Teacher's Scholarships should be made upon blank forms to be obtained from the Registrar of the University.

PRACTICE TEACHING.

Ample opportunity will be afforded for practice in teaching by (a) attendance upon observation classes conducted by experienced teachers, and (b) actual practice in teaching under the supervision and subject to the criticism of teacher critics.

EXPERIMENTAL WORK.

The psychological laboratory and the courses in experimental psychology offered in the University are open to students in this Division. The courses are modified each year to meet the requirements of the students electing them, and the laboratory is especially equipped with apparatus for the investigation of problems of interest to students of education. The school system of a large city offers ample opportunities for observation and for the empirical study of practical educational problems.

TEACHERS APPOINTMENT BUREAU.

The Division of Education maintains a Teachers Appointment Bureau for the purpose of aiding students who are studying, or have studied, in the Teachers Course, or in Columbian College, to secure positions as teachers. This service is performed gratuitously, in the interest both of students and of superintendents of schools and boards of education wishing to employ teachers. Communications should be addressed to the "Teachers Appointment Bureau." The George Washington University.

COLLEGE RESIDENCE FOR WOMEN.

Arrangements have been made for the accommodation of a limited number of women desiring residence in the College Building for Women. Application should be made to the Dean of Women, The George Washington University.

COURSES OF INSTRUCTION.

Courses of Instruction are offered in the several branches of educational theory and practice, as follows:

- a. History of Education, Courses 20, 21
- b. Educational Psychology, Courses 1, 2, 22, 23, 40.
- c. Principles of Education, Courses 24, 28, 32a, 32b, 37.
- d. General and Special Method, Courses 25, 26, 29, 30, 34a, 34b, 35
- e. Administration and Supervision, Courses 27a, 27b, 35a, 35b, 36.
- f. Practice Teaching, Courses 31a, 31b.

Students may begin their work in Education with either Educational Psychology (Course 1 or 2) or the History of Education (Course 20 or 21); but one or the other must precede, or be taken parallel with, all other courses in Education. Candidates for a degree in the Teachers Course are required to take Course 1 in Philosophy either before, or in conjunction with, their first course in Education. They must also complete before graduation Courses 1 or 2, 20 or 21, 22 or 24 or 25, 27a, 27b, 31a or 31b, and electives amounting to at least one unit in Education, and are recommended to take courses 24 and 25, or their equivalent, in Philosophy. Students desirous of specializing in School Administration are advised to take also courses 1 and 2 in Economics and 20 and 21 in Sociology.

First Section. Primarily for Undergraduates.

1. Educational Psychology. Application of the principles of psychology to teaching. Instincts and capacities; habit formation; inductive and deductive methods; formal discipline; the psychology of moral training; motor training. Text-book and assigned reading. Tu. and Th. at 10:30. First half-year. Assistant Professor RUEDIGER.

2. The Psychology of the Teaching Process. The course includes the science and art of the recitation and of school management in general. Specially designed for teachers. Tu. and Th. at 4:50, or at an hour to be arranged. First half-year. Mr. BLACK.

3. General Psychology. Systematic study of the chief facts and principles of psychology with special reference to educational theory. Experimental demonstrations. Text-book and discussions. Designed for teachers, and for students taking course 1 or 2, who have not had Philosophy. 1b. Mon., Wed. and Fri., at 4:50. Assistant Professor RUEDIGER.

Second Section. For Undergraduates and Graduates.

20. History of Education. The contributions of Plato, Aristotle, Bacon, Comenius, Locke, Rousseau, Pestalozzi, Froebel, Spencer, Hall, Dewey and others. Attention will be given to the relations between the educational thought and the great social and political movements of the same period. Monroe's *History of Education*, with lectures. Sat., 10:30 to 12:30. Throughout the year. (Two hours credit.) Dr. MYERS.

21. History of Education. A general course in the history of education involving a study of those epochs during which fundamental principles of education were conceived and formulated; the historic basis of present educational problems. Monroe's *Text-book of the History of Education*, supplemented by assigned reading and reports. Tu. and Th. at 11:30. Throughout the year. Assistant Professor RUEDIGER.

22. Child Study. The psychology, physiology, and hygiene of childhood and adolescence with special reference to the problems of teaching. Kirkpatrick's *Fundamentals of Child Study*, supplemented by lectures, assigned readings and reports. Sat., 10:30 to 12:30. Throughout the year. (Two hours credit.) Dr. SMALL.

23. *Advanced Educational (Genetic) Psychology*. A systematic course in those quantitative studies in psychology which bear upon education, followed by a review of the recent literature in educational psychology. Source material is freely drawn upon. The course is especially designed for high school teachers, supervisors and grade principals who have had adequate previous training. Thorndike's *Educational Psychology* is used as the basis of part of the work. Two hours throughout the year. Not given in 1907-08. Assistant Professor RUEDIGER.

24. *Principles of Education*. A comprehensive course on the fundamental principles—biological, sociological, ethical, and psychological—underlying education; the relation of these principles to educational aims and practices, to the selection of studies and the curriculum, and to the problems of school organization. Lectures, assigned reading and discussion. Mon., at 10:30; Wed., at 10:00. Throughout the year. Assistant Professor RUEDIGER.

25. *Theory and Practice of Secondary Education*. A brief review of the history of secondary education in the United States; the function of the high school; recent tendencies in high schools; the high school curriculum; special method in high school branches. Lectures, assigned reading and discussion. Mon., at 11:30; Wed., at 11:00. Throughout the year. Assistant Professor RUEDIGER.

26. *Theory and Practice of Elementary Education.* The application of the principles of education and of psychology to elementary school problems; recent tendencies; classroom management; the technic of teaching. Text-book and assigned reading. *Tu.*, and *Fri.*, at 4:50. Second half-year. Assistant Professor RUEDIGER.

27a. School Management. The purpose of this course is to discuss, chiefly with reference to higher elementary and secondary school teaching, the principles and practices of school, class and pupil instruction and discipline in both public and private schools. The methods and devices employed in successful schools, both regular and special, will be presented in detail. The course is designed both for principals, supervisors, and other teachers of experience, and for systematic students of education. Fifteen lectures. *Th.* at 4:50. First half-year. Superintendent CHANCELLOR.

27b. School Legislation, Organization, and Administration. This course will present the social, economic, political, and cultural principles, both historically and philosophically, that have lead to modern American practices in respect to public, private, and endowed educational institutions and systems. In the light of these principles, the methods and prescriptions of both the theory and the practice of public school administration will be presented. This course is designed for superintendents, directors, principals, and systematic students of education. Fifteen lectures. *Th.*, at 4:50. Second half-year. Superintendent CHANCELLOR.

28. Educational Theory. The list of topics in this course includes five lectures upon the theoretical bearing of certain questions relating to educational practice. The later lectures of the course will consider the four great modern theories of education, the culture epochs or recapitulation theory, the sociological theory, the historical or opportunity theory, and the psychological theory. There will also be a discussion of comparative national theories. Fifteen lectures. First half-year. First five lectures, Commissioner BROWN. Ten lectures, Superintendent CHANCELLOR.

29. General Method. The logical and psychological factors as determining the processes of learning and teaching. *Mon.* and *Wed.*, at 4:50. Second half-year, Mr. BLACK.

30. The Method of the Recitation and Practical Problems of Class Management. The purpose of this course is to bring the student of theoretical education into touch with the actual problems of the classroom and to afford an opportunity for persons actively engaged in

teaching to consider the problems of daily teaching by means of class discussions, lectures, and assigned readings. *Tu.* and *Th.*, at 5:40. Second half-year. Mr. KRAMER.

31a. Observation and Practice. Classes in observation and teaching in practice schools will be organized with the aim in particular to supplement the courses in elementary and secondary education. To count as two hours per week for half a year. First half-year. Assistant Professor RUEDIGER.

31b. Observation and Practice. Parallel with Course 31a. Second half-year. Assistant Professor RUEDIGER.

32a. Manual Training in Education. Historical survey. The justification of manual training from the biological view-point; from the sociological and economic view-points. Its fundamental aims. Present tendencies and dangers. Special problems. One hour. First-half-year. Dr. MYERS.

32b. Moral Aspects of Education. The place of the school in moral training, in relation to the home, the church, and the general social environment. The physiological basis of character. Developments of the moral nature in the child. Individual differences. The teacher's personality. The various means afforded by every school for moral training. Direct versus indirect means. Special methods of moral training.—Abbotsholme, Ethical Culture school, Elmira Reformatory, etc. Harmonizing the moral forces of the school. One hour per week. Second half-year. Dr. MYERS.

33a. School Sanitation and Hygiene. This course will present such data and principles of hygiene and sanitation as are necessary for intelligent teaching. Special attention will be given to diseases and defects incident to school life, to instruction as related to fatigue, and to particular subjects and practices. Lectures, demonstrations, and reference work. One hour a week. First half-year. Dr. SMALL.

33b. Education as a Factor in Public Health. This course will consider the function of education in promoting public health; the present status of health control in public education; and the administration problems involved. Seminar open only to advanced students. One hour a week. Second half-year. Dr. SMALL.

34a. Method in Teaching Grammar and Composition. Designed for both elementary and secondary instruction. One hour a week. First half-year. Mr. BLACK.

34b. Method in Teaching Reading and Literature. (In sequence to Course 34a.) One hour. Second half-year. Mr. BLACK.

35. Nature Study. Seminary Course. Individual problems worked out with reference to the principles and methods of nature study. One hour a week. First half-year. Mr. BLACK.

36. Foreign School Systems. A study of the school systems of Germany, England and France, with a consideration of their bearing upon education in the United States. Lectures, assigned reading and discussions. One hour. First half-year.

37. Educational Ends and Values. Lectures on the Philosophy of Education. One hour a week. Second half-year. Professor HOUGH.

(Courses 32 to 37 inclusive will not be given in 1907-08, but may be expected in 1908-09.)

Third Section. Primarily for Graduates.

40. Educational Psychology. Special problems in the psychological basis of educational theory will be arranged for graduates taking a major or minor in Education. Professor HOUGH.